Australian Consumers' Association

January 1993

CHOICE

HAIR CARE
About hair, the products and the hype

FACTS ABOUT BREAST CANCER
Don't bury your head in the sand

INDOOR AIR POLLUTION
Is your home making you sick?

Washing machines

Kettle barbecues

CHOICE

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Registered Office: 57 Carrington Road, Marrickville NSW 2204 **Telephone:** (02) 558 0099
Subscription enquiries: (02) 558 8088 **Fax:** (02) 558 9341

PUBLICATIONS

Managing Editor: Catherine Gray **Deputy Manager:** Jane Mackenzie
CHOICE: Jane Mackenzie (Editor) **Consuming Interest:** Alison Kahler (Editorial co-ordinator)
Books: Keren Lavelle (Commissioning Editor) **Journalists:** Peter Cerexhe, Christopher Connolly, Tom Crawley, Colleen Ford, Alison Haynes, Natalie Hoy, Jackie Lacey
Production: Louise Williams (Manager), Chris Roberts (Designer), Joe Sydney
Verification: Elizabeth Montague (Manager), Ron Bitmead, Pam Gardiner, Ruth MacKay, Karin McInerney
Marketing: Rob Asser

FINANCE & ADMINISTRATION

Manager: Alan Johnston
Accounts: Jeanette Dwyer, Wolf Sommer
Administration: Robyn Miller (Co-ordinator), Peter Griffin, Joanne Kladis, Christine Shaday, Joyce Slattery, Roslyn Sydney **Reception:** Sandra James
Subscriptions: Thelma Bracken (Senior Supervisor), Jean Gordon, Simmone Hamilton, Rosemary Martin, Jeanette Porter, Kerry Preston, Chantal Pucella
Data Processing: Tim Fleming (Manager), Tony Harrison, Kathy Theochari

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Administration & Marketing Co-ordinator: Lisa Walton
Tests & Technical Research: Neill Patterson, Des Shales, Bernadette Walsh (Project Managers), Jane Bowden, Brian Champion, Annette Coburn, Stephen Fisher, David Hilliger, Rob Irwin, Marissa Nerwich, Louise Newey, Raja Rajagopal, Beverly Reichman, Helen Ross, Max Wijasuriya, Clive Holmes (Program Manager)
Survey Research: Christine Franks (Manager), Theresa Thomas (Senior Researcher), Kate Murdoch, Mary Heffernan, Larraine Hall; Russ Hausfeld and Peg Hayman (Consultants), Vik Nair, Elizabeth Craig, Michelle Sprod, Chris Ho, Dorothy Kneale, Jan Rigby
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All products tested are bought by ACA's anonymous buyers the way consumers normally do. No samples are accepted. Ratings and conclusions are based on laboratory tests, user tests and/or expert judgments.

Our findings cannot be applied to models other than those included in reports. We do not necessarily test every product available in any particular class of goods. Because the quality of goods can vary or be varied, test results are not infallible. We put a lot of effort into double-checking and getting the facts and test results right. If a mistake slips through, we publish a correction as soon as possible. However, information also dates. If this issue is no longer current when you want to use its advice, call our Information Service to check whether changes have taken place before buying.

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Editorial

EVERY NOW AND AGAIN our Consumer Information Service gets a spate of enquiries about a 'business proposal' or a 'work-from-home' advertisement which turns out to be nothing more than a con job.

Unfortunately in these hard economic times there are many people desperately in need of work and financial returns — which makes these schemes sound all the more attractive.

There are some ground rules consumers can apply to schemes they see advertised or proposals they receive in the mail.

■ If it sounds too good to be true, it probably is. (A cynical but healthy approach to these schemes is to remember that if it really is a money-spinner, no-one in their right mind would want to share it with you.) Don't be tantalised into sending off money for more information if you can't afford to waste it.

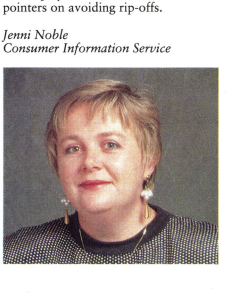
■ Never send money overseas, or to a postbox address. Genuine advertisers will include a street address, and a telephone number to take enquiries.

■ Be suspicious of any scheme which advertises 'work from home'. At best they can be exploitative, at worst, an absolute con.

■ Don't be talked into paying out money "to get you started" — for example, paying for an expensive portfolio of photographs on the slim chance of getting into modelling.

■ The same warning applies to any scheme where you have to buy a kit in order to work or sell the company's products. Many of these are network selling schemes. Not all of them are a rip-off, but you need to check them out carefully before you hand over your money. Read *Are you ready for riches?* in the July 1992 issue of CHOICE for pointers on avoiding rip-offs.

Jenni Noble
Consumer Information Service



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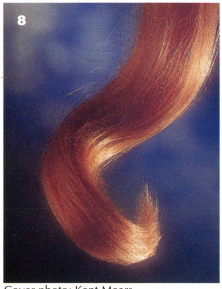

Cover photo: Kent Mears

Next issue

Water filters, cameras, dishwashers, fruit substitutes and packaged meals for children, credit cards, telecommunications update — what the recent changes mean for you.

March, April, May

Tests: Video recorders, multi-disc CD players, computer printers, laundry detergents, televisions, flued gas heaters, shampoo vacuum cleaners, sewing machines, fridges, low-alcohol beer, paint, perfume.

Features: Savings plans, insulation, asthma management, animal testing for cosmetics, recycling review, insurance dispute review scheme — is it working?, how different types of heating compare, school canteens, what it costs to get a product into a supermarket.

Features

8 Hair — the long and the short of it

What's in shampoo? How does conditioner work? Why does hair go grey? And what's the basis for all those marketing promises? Everything you wanted to know about hair and hair products.

14 Made in Australia

'Product of Australia' probably doesn't mean what you think it means — it certainly doesn't mean what nearly two-thirds of the people we surveyed thought. There's no excuse for such misleading labelling, and it's time the rules were changed.

18 Breast cancer

Doctors are concerned many women aren't taking all the steps they can to help them detect breast cancer at an early stage when chances of recovery are good. This article provides state-of-the-art information about breast cancer, its detection and treatment — don't bury your head in the sand!

24 Safe in the shade

Putting something between your skin and the sun — be it clothing, shade or sunscreen — is the best way to protect yourself from ultraviolet radiation. But some materials are better than others at blocking the rays.

30 Home sick

Four walls, a floor and a roof can trap air pollutants in your home, potentially making you sick in the short or long term. What should you look out for, and what can you do?

Tests

36 Kettle barbecues

Through experimentation and practice you'll eventually cook food well on all these barbecues — but the instructions of some of them help you on the way, while others are downright misleading.

40 Washing machines

A round-up of the market for medium to large (4-7 kg load) automatic washing machines — 84 models in all.

Departments

4 Choice Cuts

Insect bombs; truth in advertising?; lead in canned foods; cut mortgage costs; central locking problems; updates.

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Green Desires — a glimpse into the future of ecological design.

17 Drivelines

Lower used car warranties for SA; cutting down exhaust emissions — without disadvantaging those on lower incomes; petrol use reduced.

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47 What do you know?

Test yourself with our regular consumer quiz.

Food

LEAD IN CANNED FOODS

SOME imported canned foods contain potentially dangerous levels of lead, a survey by the Western Australian Health Department and the Chemistry Centre (WA) has found.

The research was prompted by the results of an earlier survey which suggested acidic food in soldered cans was likely to contain a much higher level of lead than that in welded cans. The WA survey — which included 184 Australian and imported cans — confirmed this. The average level of lead in food from soldered cans was almost nine times that in welded cans.

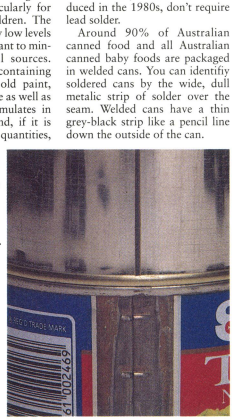
The survey also found six samples which exceeded the current maximum concentration of lead permitted under the Australian Standard of Metals and Contaminants in Foods. All were from soldered cans: five of sardines in tomato sauce from Morocco and one of pickled leeks from China.

Ingesting lead poses a significant health risk, particularly for babies and young children. The body tolerates only very low levels of it, so it's very important to minimise intake from all sources. These include air containing leaded petrol fumes, old paint, some ceramic cookware as well as canned foods. It accumulates in the body over time and, if it is present in large enough quantities, has a toxic effect on the nervous system. It's believed adults can tolerate up to 0.05 mg of lead per kilogram of body weight per week, and children 0.025 mg/kg of body weight per week.

The maximum level of lead permitted in foods in Australia ranges from 0.2 mg/kg to 2.5 mg/kg, depending on the food. Given that no Australian sample tested contained more than 0.45 mg/kg of lead, the Health Department of WA believes the current limits are too high and could be significantly reduced. It has recommended the National Food Authority review these limits, and that the current limit for lead in infant foods — 0.3 mg/kg — may be appropriate for all canned foods.

Lead solder has been used to seal the side seam of food cans for many years, to protect the contents from microbiological contamination. Over time, however, the lead leaches into the food. Welded cans, which were introduced in the 1980s, don't require lead solder.

Around 90% of Australian canned food and all Australian canned baby foods are packaged in welded cans. You can identify soldered cans by the wide, dull metallic strip of solder over the seam. Welded cans have a thin grey-black strip like a pencil line down the outside of the can.



What to look for when buying acidic food in cans: welded cans have just a thin grey-black strip (top), while you can clearly see the join and the solder line on soldered cans (bottom).

Advertising

TRUTH IN ADVERTISING?

AUSTRALIANS are suspicious of ads for banks and bank products and for products which claim to be environmentally friendly, according to a survey by Legal and General, the life insurance and superannuation group.

The survey found two out of every 10 people thought these kinds of ads were least likely to be truthful — more than were cynical about claims made in advertising for cars, store discount sales, real estate or general insurance.

Fire hazard

INSECT BOMBS CAN BE A BLAST

WARNING: insect bombs can cause fires. At least five house fires have been linked to these devices since November 1991.

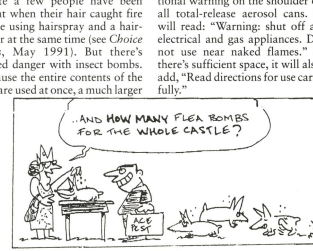
An insect bomb is a small aerosol can containing insecticide and a propellant. They're designed to be used in rooms with serious cockroach or flea infestations. When you press a trigger on top of the can it locks down and the contents of the can are released over a fairly short period of time. The problem is that the propellants currently used are highly flammable.

In these days of CFC-free aerosols, hydrocarbons such as butane and propane are used to push the insecticide out of the can. They're effective and are kinder to the ozone layer, but with the right mixture of propellant and air, they can easily ignite. A spark from a fridge electrical system or the pilot flame on a gas hot water heater can cause an explosion and fire.

Any aerosol containing hydrocarbons is a potential fire hazard if used near a source of ignition. Quite a few people have been burnt when their hair caught fire while using hairspray and a hairdryer at the same time (see *Choice Cuts*, May 1991). But there's added danger with insect bombs. Because the entire contents of the can are used at once, a much larger amount of propellant is released than with a quick squirt of hairspray, so there's the potential for a larger explosion. Also, to work effectively the bombs have to be used in sealed rooms, so the propellant won't dissipate as quickly. And because you have to leave the house until the insecticide has been released and has settled, you won't be there to notice the fire and quickly put it out.

We bought four brands of insect bomb and looked at their safety warnings. All had adequate warnings, including directions to turn off all electrical appliances and naked flames. All except one specifically mentioned shutting off gas hot water heaters. The warnings were incorportated into the first step of the directions and were written in plain English. However, even the best warnings can't help those who don't read them.

The manufacturers of the insect bombs we looked at have informed us that the aerosol industry has decided to include an additional warning on the shoulder of all total-release aerosol cans. It will read: "Warning: shut off all electrical and gas appliances. Do not use near naked flames." If there's sufficient space, it will also add, "Read directions for use carefully."



Total recall

THE ULTIMATE IN CENTRAL LOCKING

IN November last year, Toyota issued a recall of Camrys with central locking made between 1986 and 1990, and GMH recalled its twin, the Apollo, made in the same period. The problem was a faulty relay that could lead to overheating of (and permanent damage to) the central locking system, resulting in all the locks in the car being jammed. There have been at least 76 cases of this occurring in the US and Japan, including 18 cases where the occupants were trapped inside the vehicle.

Toyota says there have been seven of these failures in Australia, but none has resulted in anyone being locked inside the car. Although there have been no reports of fires either here or in the US, *Consumer Reports* (our US counterpart) believes parts of the lock may smoulder and become dangerously hot. It cites a case where a woman returned to her car and found it filled with smoke and the door panels hot to touch.

The recall is an international one and includes over 23 000 Australian Camrys and Apollos (both imports and locally produced models). *Recalls and bans* on page 47 has details of the exact models affected.

Finance

CUT YOUR MORTGAGE COSTS

RECENTLY banks have been advertising amazing mortgage deals which cut years off the repayment term and so save you thousands of dollars.

The 'secret' of these deals is really no secret at all — your repayments are higher, and so you pay off the capital earlier and there's less interest to pay.

Although some mortgages charge extra for paying off early, or don't let you vary your repayments, many will allow you to cut the term — and so potentially save thousands of dollars.

Just paying fortnightly instead of monthly can save a substantial sum. For example, if you paid $423 each fortnight instead of $846 a month towards your $100 000 25-year mortgage charged at 9.5%, you could knock 69 months off the term (and nearly $42 000 off the total repayment). Not bad, but also not so surprising when you realise there are 26 fortnights in a year and only 12 months — so by paying fortnightly you're making the equivalent of 13 monthly payments each year.

Another way of cutting down the total cost is to increase your payments over the term of the mortgage. Even paying monthly, if your payments went up by 4% each year starting at $846, you could knock 129 months off the term of the mortgage — saving a total of $64 465 (with a final full monthly payment of $1465).

Paying off a mortgage early is a good idea for many people, because you wouldn't get the same 'return' from a savings account. And in times when your earnings are increasing, payments that looked steep when you took out the mortgage could seem small — even after just a few years.

Another way to cut your payments is to use a mortgage offset account. This is a type of savings account for which interest isn't paid out to you, but goes, in effect, towards paying off your mortgage with the same institution (and you won't be up for income tax on the interest you 'earn', either). If you want to save money but keep it easily available, ask your mortgage lender if they offer a mortgage offset account and compare the benefits against the after-tax return from other investments on offer.

But remember, mortgages don't pay themselves off — you do. And unless an institution reduces your interest rate the only way you can cut the total amount of interest is to pay off a proportion of the loan early.

BECOME A CHOICE PANEL MEMBER

IN the November issue we asked for subscribers willing to become members of various panels the Consumers' Association is starting on product reliability and utilities. We're still keen to recruit more members — the more people on each panel, the more representative of consumers across Australia the panel becomes.

Consumers are naturally interested in the durability and reliability of cars and household appliances — and time, cost and logistics prevent us from testing these aspects in our labs.

Could you spend a few minutes a year filling in a questionnaire on the reliability of the appliances and/or car you own? Combined with information from thousands of other CHOICE subscribers on the panels, you'll be helping us to make reliable predictions about the life and performance of these items, which we'll pass on to you in CHOICE.

We also want to collect information on subscribers' experiences with utilities: telephone, water, electricity and gas. Since the organisation of these utilities is changing — along with proposals to privatise them — we want to gain a clear view of consumers' current experiences with their services and products, and to keep track of how changes implemented in the next few years directly affect consumers.

This information is vital to enable us to ensure the viewpoint of consumers is accurately and comprehensively presented to government and to the utilities themselves, so the impact of changes can be taken into account before major alterations to services are implemented.

If you can complete one, two or all three questionnaires a year, please call us on (02) 558 8077 and leave your details. Alternatively write to us at Reply Paid 14, Consumers' Association (Surveys and Trials), 57 Carrington Road, Marrickville 2204 (you don't need to use a stamp). Please enclose your name, address, subscriber number (you'll find it on the mailing sheet that accompanies CHOICE) and telephone number. We'll start sending questionnaires later in 1993.

If you were a member of the reliability panel, we already have your details and you don't need to contact us again unless you've changed your address.

Your interest and help will ensure the Consumers' Association speaks effectively for all consumers. Thank you.

CORRECTIONS

CONSUMER-IN-LAW

CHOICE, November 1992

On page 30 we gave the phone number for the Norwood Community Legal Service as being (08) 205 0155. This is in fact the number for the advice line of the Legal Services Commission of SA, which also has a toll-free number (008 188 126) for callers outside Adelaide. The service operates Monday to Friday, 9 am to 12.30 pm, 2 pm to 4 pm. Norwood Community Legal Service's number is (08) 362 1199. We apologise for any confusion this has caused.

MEDIUM-SIZED COLOUR TELEVISIONS

CHOICE, July/December 1992

On page 41of the July issue we stated the **PANASONIC TC-48R50** had been replaced by the **TC-2001AR** (technically the same but made in Malaysia instead of Australia). The **TC-2001AR** in fact replaced the **TC-48R60**, as we said on page 44.

The *Annual Buying Guide* in December 1992 listed the **PANASONIC TC-48R60** in the *What to buy* list for these televisions. This should have been the **PANASONIC TC-48R50**; the error was typographical only — the prices given were for the **TC-48R50**.

ANNUAL BUYING GUIDE — FAX MACHINES

CHOICE, December 1992

On page 16 under *Fax machines*, the top performer in the original test (in the January 1992 issue), the **PANASONIC Panafax UF-121**, should have been included in the *What to buy* list. Panasonic informs us it will still be available for a few months before being superseded, and is selling in the price range of $869-$999.

GREEN PAGE

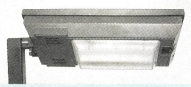
GREEN DESIRES

Q: How can consumer goods — now a fundamental part of the environmental problem — become part of the solution?
A: Through better design.

BETTER DESIGN is the message of *Green Desires*, a travelling exhibition that's been on in Sydney, Melbourne and Adelaide over the last few months. The exhibition brought together products which mark the beginning of this transformation. While not necessarily 'perfect' from an environmental point of view, the exhibits are good examples of how a product's design can significantly reduce its impact on the environment.

The products on these two pages are a sample from *Green Desires*, which was put together by the EcoDesign Foundation, reported on in the September 1992 *Green Page*. (Please note CHOICE hasn't tested these products so we can't comment on their performance.)

If you're interested in more information, the catalogue from the *Green Desires* exhibition is available from the EcoDesign Foundation for $10. Write to Box 233, Holme Building, University of Sydney 2006, or phone/fax (02) 516 3589.



Acapulco garden lamp

This lamp uses solar photovoltaic cells to collect light during the day, converts it to electricity, then uses this to charge the battery which powers the lamp at night. It's been designed to light up pathways or other garden features, like ponds. The silicon cells used in photovoltaic technologies produce electricity directly, which can be used immediately or stored in batteries. The type of cell used varies, depending on the application. Small, low-voltage appliances like this and the portable lamp, below, use 'thin film' technology, which has a relatively low level of efficiency. 'Sheet' or 'ribbon cell' technology is thought to have the greatest potential. Still in the development stage, in this technology the cells are made in a flexible laminated form, are very efficient and are not degraded by light — a problem which limits the life of older cell technologies.

(Acapulco and Portalux lamps manufactured in France by Chronar, imported by Erie Control Systems (NSW) Australia, (02) 417 8577.)

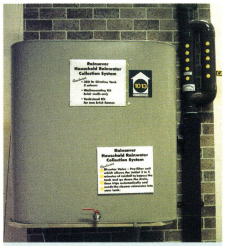
Aquapore soaker hose

Made from recycled car tyres, this US-designed product goes on or just under your garden soil. Water seeps through the hose, minimising water lost by wind and evaporation, which is a drawback of sprinkling.

(Available from Encore Rubber Technologies, which will start making the soaker hose in Australia early this year; (03) 305 2585.)

Cast-iron cooking pot

A return to old, traditional products can also have environmental advantages. A cast-iron cooking pot might involve more costs at the manufacturing and purchasing stage of its life, but it will probably outlast its user. A change in consumer attitude to one where we opt for well-made, long-lasting products rather than cheap throwaway items makes environmental sense.



The slimline 'rainsaver' water tank

This water tank is designed to collect rain and stormwater for domestic and garden use. Its slim, compact design means it can be mounted on a brick wall in suburban and even inner-city yards without taking up most of the garden or being an eyesore. With water authorities considering charging for water per litre used, a product like this could also be a money saver in the future.

(Manufactured by Rainwater Tanks Australia, (02) 264 9276.)

Insulation material

Insulation batts and boards made from recycled newspaper and other low-grade paper are a great way to turn a waste disposal problem into a useful product. A simple process turns the paper into a stable, rigid material which insulates a building from heat, cold and noise. This is a prototype product, which is being developed by the Australian Pulp and Paper Institute, Monash University, and Flexicoat Australia. According to Rolf Hartelt of Flexicoat, the product is non-flammable as it contains a large quantity of fire-retardant chemicals. He says despite very positive results in tests on its heat insulation and sound absorbency, he is having trouble finding backers to get the material into production.

(For more information contact Rolf Hartelt, (03) 758 0066.)

Solar-powered battery recharger

This neat gadget converts sunlight into direct current (DC) power to recharge NiCad batteries. It's ideal for placing on a windowsill, especially if you have a north-facing window. According to Clive Campbell of Windpower Australia, how long it takes depends on the strength of the sunlight and how much the batteries are discharged. Normally, one AA size battery takes two to three hours.

Solar-powered bicycle lamp

Two AA batteries charged by the sun's energy during the day run this bike light for around 1½ hours at night. Solar charging will work on overcast days, according to Windpower Australia, but it takes longer.

(Both imported from Hong Kong by Windpower Australia, (02) 606 0720.)

The U kettle

A design of things to come, this plastic kettle has been made not only to work efficiently during its lifetime but also to be recycled when its time is up. To minimise the labour and other costs which reduce the viability of recycling, it's been designed to be disassembled easily — no glues or screws have been used to hold its component parts together. Its manufacturer, GE Plastics in the US, has set up a separate company which will buy back the kettles and regrind the materials for recycling.

(Not available in Australia.)

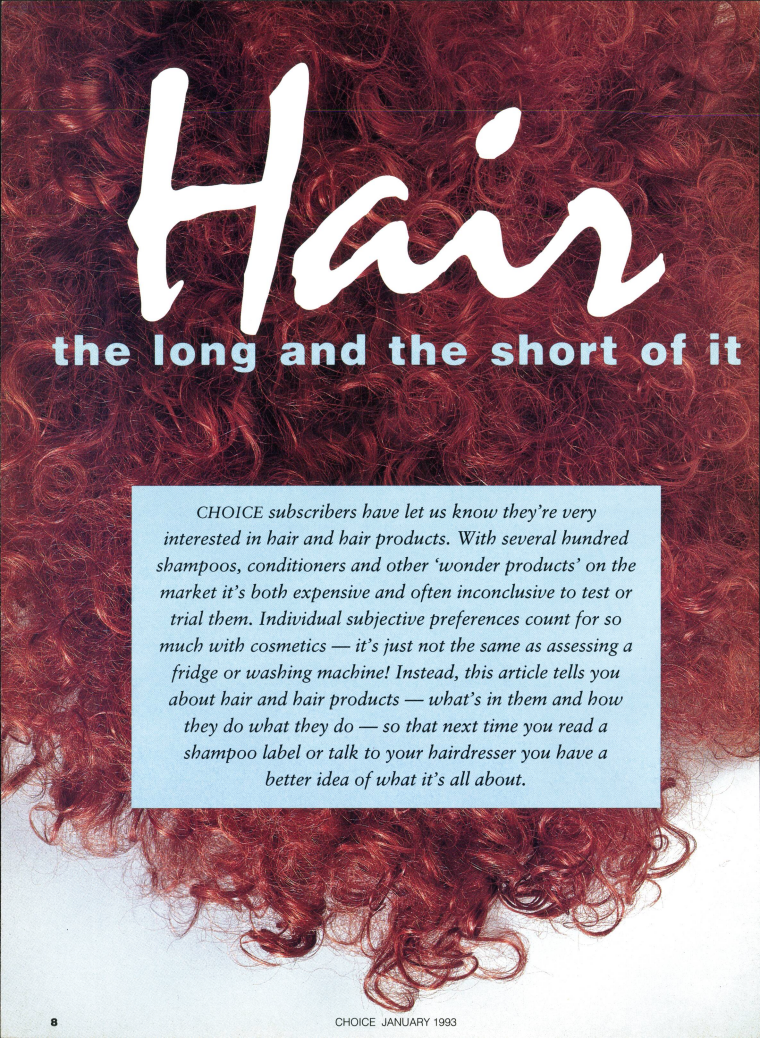
Kyocera Ecosys aSi laser printer

Hi-tech products can be designed to have a lower environmental impact, like this printer. The aim of its manufacturer was to design a high-quality, long-life printer which eliminated the major environmental drawback of conventional laser printers — throw-away print cartridges. These cartridges contain the drum, fuser and toner — which form the words on the page — and need replacing 60 to 75 times during the life of the printer. They are made of metal and plastic.

The **KYOCERA** printer doesn't use cartridges. It has a built-in drum made of amorphous silicon — an extremely hard, durable material — and long-life developer and fuser units, which don't need replacing. Kyocera has also developed a toner made of microfine ceramic powder that contains tiny ceramic chips that scour the drum, cleaning and reconditioning it every time the printer is used. This action is claimed to enhance the durability of the printing components and maintain a high print quality.

The only waste product involved in using this printer is the carton the toner comes in. This is made of recyclable plastic and contains no metal parts. If it is burnt, the type of plastic used won't give off toxic fumes. Kyocera claims the **Ecosys aSi** printer uses 30% less energy than a conventional laser printer and, because you don't have to replace the drum, as you would conventional printer cartridges, reduces the cost of printing per page by around 45%.

(Available from Kyocera Electronics Australia, (02) 906 8075, and major dealers.)



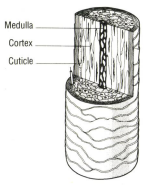
Hair

the long and the short of it

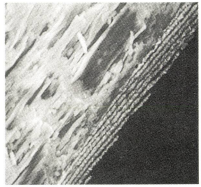
CHOICE subscribers have let us know they're very interested in hair and hair products. With several hundred shampoos, conditioners and other 'wonder products' on the market it's both expensive and often inconclusive to test or trial them. Individual subjective preferences count for so much with cosmetics — it's just not the same as assessing a fridge or washing machine! Instead, this article tells you about hair and hair products — what's in them and how they do what they do — so that next time you read a shampoo label or talk to your hairdresser you have a better idea of what it's all about.

What is hair?

Hair is primarily made of a tough protein, keratin — the same one found, in a softer form, in the skin. It grows from millions of tiny bulbs in the skin, called hair follicles. In the bulb the cells are soft and plastic-like, but as they travel through the skin they harden, becoming keratinised; once they emerge from the skin, they are dead.



Cross-section of a human hair showing the three layers in its structure.



Microscopic section through a hair showing the rod-like structure of the cortex.

(Photo courtesy Unilever Educational Booklet)

It's the state of the outer layer, or **cuticle**, which largely dictates how your hair looks. The cuticle is made up of a number of layers of horny cells arranged like roof shingles. When these cells lie flat and are undamaged, they reflect light well so the hair looks shiny. But if damaged by detergents, the sun, perming or bleaching, they lift away slightly, becoming rough. They may even fall off in places, exposing the next layer — the **cortex**. The cortex is made up of spindle-shaped cells surrounding the **medulla** — a soft spongy central core.

The hair follicle is active in spurts known as the **anagen** phase, which averages 1000 days — nearly three years. During the next phase, **catagen**, which lasts a few days, the follicle shrinks and the hair moves up towards the skin surface. The final resting phase, **telogen**, lasts about 100 days or several months, then the hair falls out. It's the duration of the anagen phase as well as the rate of growth which influences the final length of the hair. At any one time each follicle on your head is in one of these phases — some may be growing, some are ready to fall out. At the end of telogen, the old site of growth is activated again and a new anagen phase begins.

The black & white (& grey) of hair colour

Hair gets its colour from pigments produced by melanocytes — special cells found in the hair follicle. The pigment is transferred into the basic hair cells (keratinocytes) which form the cortex, but it can be seen through the translucent cuticle. The main pigments are the black or brown eumelanin, and phaeomelanin, which is yellow or reddish.

Going 'grey' is a misnomer — in truth, hairs go white. But usually it's only individual hairs in a head of different colours, so the overall effect is more grey than white.

And what's happening? Simply a shutdown by the melanocytes. They stop producing pigment so the hair appears white. White hairs first appear at the average age of 34 and by 50, half the population has an equal mixture of white and coloured hairs. But there are always exceptions — some people in their teens may start noticing white hairs.

If you think you can go grey overnight, read *Facts and myths* on page 13 and think again.

Dandruff — a common complaint

Fifty per cent of the population are said to suffer from dandruff — an excessive scaling of the scalp. It's not considered a disease, nor is its cause agreed on. While it can't be cured, there are a number of shampoos on the market with 'special ingredients' claimed to control dandruff.

Some scientists are convinced dandruff is caused by a yeast-like organism, *Pitrosporum ovale*; others seem equally certain micro-organisms are not the cause. So how else could you explain dandruff? Other suggestions include an allergy to something in sweat; fats in the diet or nervous tension.

Washing the hair more frequently, perhaps every day, is one way of dealing with dandruff. The many 'medicated' products available aim to reduce dandruff without having to wash the hair as frequently. The active ingredients include:

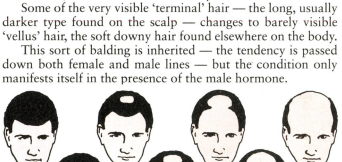
- **Zinc pyrithione** and **selenium sulphide**, which seem to act by reducing turnover at the skin surface by slowing the process whereby cells harden and become filled with keratin (keratinisation). Coal tar preparations may also work like this.
- **Salicylic acid** and **sulphur** inhibit the development of dandruff flakes by dissolving the cement that holds the flakes together.
- **Piroctone olamine** is thought to work by preventing the breakdown of sebum (an oily substance secreted by a sebaceous gland next to the hair follicle) into irritating substances which cause increased scaling. It does this by reducing the number of bacteria which act on sebum, and preventing its oxidation.
- Other ingredients, and even some detergents, are thought to help break scales into smaller units — which may not show.

Hair today, gone tomorrow

The much cursed balding common in males (called male pattern alopecia) occurs for a number of reasons. The growth spurts of the hair become shorter; the hair follicles spend more time at rest; and about a third actually shut down.

Some of the very visible 'terminal' hair — the long, usually darker type found on the scalp — changes to barely visible 'vellus' hair, the soft downy hair found elsewhere on the body.

This sort of balding is inherited — the tendency is passed down both female and male lines — but the condition only manifests itself in the presence of the male hormone.



The typical progress of male pattern balding.

What's in a shampoo?

Some shampoos say they're good for oily or dry hair, others promise to repair damaged hair. Is there *any* basis for claims like these?

To be fair, shampoo formulas try to juggle somewhat contradictory roles — they must remove the dirt-containing oil on the hair, but not so much that the hair is left dull and rough. In struggling to reach the perfect formula, there are many choices available and many opportunities for marketing claims.

Formulas for oily hair tend to have more detergent; a 'flyaway' formula may contain substances which reduce static. But these differences are much less clear-cut when it comes to lathering up under the shower: the inescapable fact remains that in blind trials, consumers have been unable to distinguish between shampoos designed for one type of hair or another.

This may be because there are many variables involved, not just your nominal hair 'type' — what grime you pick up from where you work, the temperature and humidity, how often you like to wash your hair and so on.

For those of you who have glanced at the ingredients listings now appearing on some shampoos, and wondered what on earth all the different chemicals do, here the main ingredients of your average bottle of shampoo are explained:

■ **Cleansing agent:** (for example, ammonium lauryl sulphate, sodium laureth sulphate.) Also called a surfactant (surface active agent), the cleansing agent (a detergent) breaks the surface tension of water and allows it to reach the hair, removing dust and dirt, sebum, dead skin cells and residues from hair dressings. Shampoos normally contain more surfactant than is needed for cleaning alone, to produce a lather which — manufacturers are convinced — is what the consumer wants. Sometimes two surfactants may work well in combination. Before the 1940s, soaps were common in shampoos, but they were replaced with synthetic detergents because when used with hard water soaps leave scum on the hair.

■ **Lather boosters:** (for example, cocamide DEA and lauramide DEA.) Even using more surfactant than necessary for cleaning does not guarantee a good lather, so a foam booster is used to stabilise the bubbles and make them last longer. Lathering does not necessarily have anything to do with proper functioning of a shampoo.

■ **Conditioning agent:** (for example, hydrolysed animal protein, glycol stearate and panthenol.) Some substances which do a good job squeaky-cleaning the hair can also leave it rough and full of static (producing 'flyaway' hair). It seems some surfactants may 'roughen' the cells on the outer surface of the hair. To counteract this, some shampoos contain a conditioning agent, which acts by depositing water-resistant substances on the hair fibre. This makes it easier to comb, but the downside is some of the conditioning agents can gradually build up on the hair, weighing it down. (So yes, there is such a thing as 'build-up'. If it becomes a problem it can be removed with a high-detergent shampoo, for instance one designed for oily hair, some of which omit a conditioning agent.)

■ **Thickening agent:** Sodium chloride — table salt — is one of the most common thickening agents used in shampoo to make it easier to handle. (Other examples include hydroxypropyl methylcellulose and ammonium chloride.)

■ **Opacifier:** (for example, cetyl alcohol and stearyl alcohol.) These are used to make a creamy, pearlescent shampoo.

■ **Preservative:** (for example, methylparaben, propylparaben and methylchloroisothiazoline.) These keep populations of micro-organisms at bay, which can infiltrate during processing or after purchase, in your hot and steamy bathroom. They may find some of the ingredients quite appetising, especially protein conditioning agents. Even shampoos such as EGO SHAMPOO **for normal hair**, which states it contains no preservative, contains 3.2% ethanol, which has some anti-bacterial properties.

■ **Fragrance:** Perfumes cover unpleasant 'base' odours and make the product more acceptable to consumers. While they don't affect the functioning of the shampoo, they can make all the difference to how you perceive it.

■ **Colour:** On labels carrying ingredients, the colours are usually listed at the end and are quite easy to pick: 'D&C Yellow No 10', for instance.

■ **Promotional additives:** These substances, be they herb extracts, vitamins or egg, are often used in such minute quantities they do more for marketing than they do for your hair. Depending on the substance and the rest of the shampoo formula, they may be beneficial, but they are most useful in giving the manufacturer a 'handle' for promotion.

For example, as an industry reference book points out, while egg alone can be used to clean the hair by a complex action involving the albumen and the lecithin in the yolk, "All this is a far cry from the extravagant claims made for minimal amounts of egg yolk churned up in an excessive amount of detergent." If you feel like experimenting with egg, remember to use cold water or you'll end up with scrambled head!

If you don't get a good lather you don't think the shampoo's working — or at least that's what manufacturers seem to think. In fact much of the lather shampoos produce is often created by a lather booster, not as part of the cleaning process at all.

We tried to track down whether products sold by hairdressers are any better than those you can buy in the shops, but we can't draw much of a conclusion. It seems the majority of what you'd find in each type of product is similar, but the salon products have more additives such as conditioning ingredients and vitamins, and less detergent — this may account for the increased price and may mean your hair feels better in the short term. But one source felt, "The chemical mish-mash won't do your hair much good in the long run." Our advice would be not to feel pressured to buy the more expensive products, but if you like the results of the shampoo or conditioner you're using, stick with it.

On condition...

Your hair has its own natural 'conditioner' — sebum. A hair in good condition has a smooth outer surface (the cuticle) and a coating of sebum which gives it shine by helping to reflect light. So a conditioner can't do anything which your own sebum can't, as long as you don't maltreat your hair.

But shampoos sometimes remove more sebum than desirable, and the cuticle may become damaged or even removed entirely in some areas by perming, bleaching, the effects of the sun and so on. If this is the case, your hair will look dull simply because a roughened cuticle doesn't reflect the light as well as a nice smooth one. And if this is the case, a conditioner can patch up your hair and improve its appearance. But its action is purely cosmetic; the hair can't 'repair' itself.

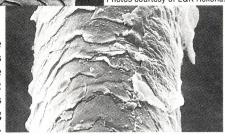
The principle of many conditioners is that above a certain pH, hair has a negative charge — so positively charged substances will be attracted to it, and if all goes as planned, stay put until the next shampoo.

The second layer of the hair strand (the cortex) has a higher negative charge than the cuticle, so where the cuticle is missing the hair will pick up more conditioner. This is true for most conditioners, not just the ones which make an advertising claim of it — "absorbs where most needed".

To promote **shine**, some conditioners also leave a thin resin-like film over the hair, smoothing down the cuticle so it will reflect light again. **Manageability** comes from lubricating elements in the conditioner which make combing easier and may help to reduce **tangling**. Some conditioning agents, such as panthenol, are claimed to work by being absorbed into the hair.

Hair as it emerges from the scalp, with flat, undamaged cuticle edges.

Photos courtesy of L&K Rexona.



Hair showing cuticle lift and broken edges — the kind of damage caused by tight winding round rollers or tangling during combing, for example.

Two birds with one stone — the two in ones

A more recent newcomer to the hair care market has been the 'two in one' — a product which claims to shampoo *and* condition at the same time. Similar products are also called 'treatment' shampoos. Many of these use the silicon-related **dimethicone**, a water-repelling (hydrophobic) substance which leaves a film on the hair.

There's nothing new about shampoos containing a conditioning agent, as you can see in *What's in a shampoo?*, left; some even contain dimethicone. Manufacturers of two in ones tell us shampoos with ordinary conditioning agents are not in the same conditioning league as two in ones — they say you just can't get the same degree of conditioning with the 'normal' shampoos; that the conditioning agents in these shampoos are not really effective. The neatest explanation seems to be that conditioning agents in shampoos prevent the damage that the surfactants alone would cause, reduce static and make it easier to comb the hair when wet; but the dimethicone in a two in one leaves a smooth coat on the hair surface, is a good lubricant and improves both wet and dry combing.

No, two in ones won't make your hair fall out or turn it green — early versions had some very bizarre accusations aimed at them.

The present disagreements about two in ones are tame in comparison with the allegations thrown at PERT 2 in 1, the first of its kind on the market in Australia in 1988. As headlines appeared saying, "Sabotage bid against product" and "Shampoo hit by smear campaign", CHOICE received letters from anxious readers saying, "...my hairdresser has warned me not to use Pert, with stories of people's hair turning green, falling out etc", and another, "[my hairdresser] advised me this shampoo was disastrous to hair, especially permed hair".

The root of the scandal was a sheet of paper purporting to be a "Pharmaceutical analysis" and distributed to hairdressers by a mysterious campaigner. The allegations included that PERT 2 in 1 would turn the hair shaft green, coat the hair (making perming and colouring virtually impossible), and cause constant swelling of the hair, which would eventually cause its breakdown. The accusations were quickly dismissed by the Federal Bureau of Consumer Affairs as well as a number of state Consumer Affairs departments.

The only point which seems to have some truth is the coating effect of two in ones. The conditioner, dimethicone, is deposited on the hair shaft because it is highly water-repellent. It leaves a film, but this is where the consensus ends. Some say this is added to in subsequent washes — but to a limit of two or three layers. Others are not convinced of such a build-up. At least one company has now commissioned trials, and data is being collected to sort it out once and for all.

Perms and colourings, which need to come in contact with the surface of the hair shaft, will not work so well if the hair is coated, but any shampoo which does not contain a conditioning agent should remove the build-up — and it's normal practice for hair to be washed with a 'stripping' shampoo before a perm anyway.

Although one hairdressers' association we contacted said it's received no complaints about two in ones over the past 12 months, we still hear of people being told by hairdressers that two in ones are bad for hair. We've come across no evidence to substantiate these warnings.

And will PERT turn your hair green? The one for normal hair *is* almost fluorescent green — a bit violent for some tastes. But the D&C green, D&C yellow and FD&C blue which give it its colour will just end up down the drain.

Three's a crowd

Following in the footsteps of two in ones, Wella recently launched a product it calls **WASH AND CARE 3 in 1 with byogen.** Its catchcry is cleaning, conditioning and **strengthening**. Presumably the point of stronger hair is that it won't break so easily, which could be good news for some people. Wella tells us byogen is a weak organic acid extracted from plants which "penetrates the hair and realigns its structure". As with all marketing claims, all we can say is try it and see. What will they think of next? Bring on the four in ones?

Hiding true colours

The challenge for hair dyes is that dye molecules tend to be large, while the cuticle of the hair strand is made up of layers of tightly packed cells which, among other things, *prevent* large molecules from entering the inner cortex.

- **Temporary colourings** are dye molecules too large to penetrate the cuticle — they sit on the surface of the hair strand until the next wash.
- **Semi-permanent dyes** are of two types. One has a smaller molecule and penetrates the cuticle, but doesn't get into the cortex. The colour gradually washes away, although some will survive six to eight shampoos.

The other sort, which some refer to as **quasi-permanent dyes,** consist of small enough molecules to enter the hair cortex — but because they are so small, they can be washed out too.

- **Permanent hair dyes** work by small molecules penetrating the cuticle, then reacting to produce a large dye molecule. Some of the reactions take place 'in the open' and the resulting colour is washed away but, more importantly, some reaction takes place inside the hair cortex. The new dye molecule is now too large to get out, so the hair colour only grows out.
- Some permanent hair dyes may irritate the skin of some individuals, so patch testing is a good precaution.

In the past there have been concerns that repeated use of hair dyes could cause cancer, as some dyes may be absorbed by the skin. But it seems none of the offending ingredients is in any hair dyes sold in Australia, and there have been no reports here of links with cancer for many years now.

Boiling water and borax

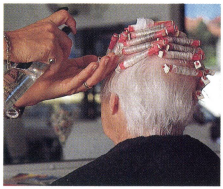
Permanent waving — now referred to as 'perming' — made its first tentative steps to the hair salon when three scientists discovered borax could give straight hair that coveted lasting curl. Until around 1910, curly locks could only be got from a curling iron, or by wrapping hair round a rod and boiling it in water. But even the latter drastic-sounding measure did not give lasting curls.

Adding borax to the boiling water, however, produced a revolutionary curl which could survive several washes. Today's perms do not conjure up such a bizarre picture (we're not quite sure how the method worked in practice!), but they do involve complex chemical reactions.

The relative curl or wave of an individual hair is determined as it emerges from the hair follicle. When it's still below the scalp, the cells which make up the hair are soft and pliable, so they can be squeezed into shape by the walls of the follicle. If the follicle is not absolutely straight, it's likely to set the hair curling as it leaves the scalp.

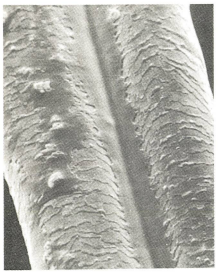
Once the hair cells have hardened (keratinised) they are very stubborn to change. The only way they can be permanently altered is by breaking the chemical bonds in the keratin (using the perm solution), then reforming these bonds (with the neutraliser solution) when the hair is in the desired shape.

The perming process: Before ...



... during

... after.



Two hairs stuck together by hairspray. Shellac from the lac insect used to be what helped hairsprays hold hairs together to maintain a style; nowadays it's polymers or synthetic resins. (Photo courtesy Unilever Educational Booklet)

All dressed up

As the picture above shows, hairsprays work by holding individual hairs together — and hopefully holding a hairstyle in place on the larger scale. Mousses and gels work in a similar way.

■ **Hairsprays** send a cloud of resin dissolved in a solution of alcohol onto the head, and as the solvent evaporates, a film of resin is left behind. Shellac (a resin-like substance from the lac insect) was the original working ingredient of hairsprays or hair lacquers. But it was rather hard and insoluble and has been replaced with synthetic resins or polymers (long chains of molecules) which are easier to wash out.

■ **Gels:** Hair gels are mostly water — the rest is a polymer which, like the resin in hairsprays, will fix the hair, plus a gelling agent to thicken the product. Other ingredients include fragrance, preservative, and a UV screen to prevent the gel from losing its viscosity in daylight. When gel is applied to hair the water evaporates, leaving the fixing substance on the hair.

■ **Mousse:** How does a mousse mousse? It's the propellant which adds the foaming touch here. It's forced through the nozzle in a watery solution and as the propellant hits the atmosphere, it vapourises, filling the solution with gas and turning it into a foam. All a foam is is lots of tiny gas bubbles in a liquid. Again, it's polymers or synthetic resins in the mousse that 'hold' your hair.

Marketing rules...OK?

Part of the research for this article involved talking to product managers, technicians and chemists in the hair product industry. Some personnel were extremely helpful and willing to talk in some technical detail about the claims their products make. Others — despite bottles shouting about a particular ingredient or quality of a product — had no convincing way of explaining it.

For example, when we asked Redken how the zinc pyrithione in its anti-dandruff shampoo worked, we were told no-one in the company in Australia could help and they'd have to contact headquarters in the US!

You wouldn't expect just any employee to know the role of all the ingredients in a shampoo, but if a company's going to market a product on the basis of a particular ingredient or property it's another matter entirely. For example, we came across a few products claimed to strengthen hair or "reinforce" its keratin, but when we asked a chemist at one of the companies why we needed stronger hair, his first reaction was "I don't know!" The cynical might conclude that the reason lies in marketing, not hair chemistry.

Once you start asking questions, the image pushed by marketing — usually some blurb on the packaging — starts to lose its shine. Take Revlon's AQUAMARINE products — "formulated with natural marine protein and enriched with essential sea minerals". Can you feel the sea breeze on your face and smell the sea air? Think of it another way: fish. And chemicals which, yes, are found in the sea, but in this case have been formulated in the lab. Doesn't have the same ring about it, does it?

And 'hydrolysed animal collagen' (found in TIMOTEI shampoo, among others) loses its appeal when you consider its origin: tallow, a by-product of the meat industry — "the left-overs of sheep and beef after they've been killed". A&F Pears, the maker of TIMOTEI, says it is reformulating this product as vegetable protein alternatives become available.

We'd suggest you take the marketing claims with a pinch of salt and simply experiment with different hair products till you find the ones that suit you. ❑

Facts & myths

Fact: Longest hair

According to the latest copy of the *Guiness Book of Records*, Mata Jagdamba of North India has the longest hair in the world — 21 feet (around 6.4 m)!

Myth: Washing more frequently makes hair greasier

How greasy your hair is depends on how active your sebaceous glands are — these are glands tucked next to the hair follicle which produce the oily substance sebum. There's no evidence that washing can influence the sebaceous gland.

Fact: The surface area of an average female head of hair is 4-8 square metres — that's how much you're washing each time.

Myth: Cutting makes hair grow faster

Hormones and seasons (beards grow faster in summer than winter) affect the rate of hair growth, but not cutting or shaving.

Fact: The average adult man has around five million hair follicles, including one million on the head — 100 000 or so of these are on the scalp.

Myth: You can go grey overnight

Individual hairs do not turn grey — brand new ones emerge from the scalp as white hairs. So — despite stories of Marie Antoinette or Thomas More turning white overnight — it's impossible.

Some cases of alopecia areata (patchy baldness) are so severe that an entire head of hair may fall out overnight, and the first hairs to regrow are often white — but even the quickest regrowth would take weeks.

Fact: There are two types of hair on the human body

The fine, unpigmented 'lanugo' hairs of the foetus are normally shed seven or eight months after conception and replaced with 'vellus' and 'terminal' hairs.

Vellus hair is the soft, short hair found all over the body except the lips, palms of the hands and soles of the feet. Terminal hair is the longer, usually darker type of hair on the scalp, eyelashes, eyebrows and so on. Any one hair follicle is capable of producing either type of hair — for instance, the adolescent male's vellus hair is replaced by terminal hair on his chin and face.

MADE IN AUSTRALIA

DOES IT MEAN WHAT YOU THINK IT MEANS?

We surveyed over 400 grocery shoppers across all states and found most people prefer to buy Australian — but they are hindered by meaningless labels.

DO PEOPLE really care where their food comes from? According to the shoppers we interviewed, most consumers *do* care, but they're confused by the wording of labels and want a single, clearly defined form of words.

We wanted to find out whether consumers understand what the terms 'Made in Australia', 'Australian Made' and 'Product of Australia' mean, and whether they thought this labelling was an adequate basis for choosing between food products. To this end we conducted a random telephone survey and spoke to someone in each household who shopped for food.

WHAT PEOPLE THOUGHT THE LABELS MEANT

The results show the three labels mean different things to different people. (The percentages in the following lists don't add up to 100 because the definitions aren't mutually exclusive — many people thought the labels implied more than one of the possible meanings.)

	% who agree
Made in Australia means:	
All ingredients made in Australia	36
Some ingredients made in Australia	62
Product processed in Australia	65
Product packaged in Australia	73
Australian made means:	
All ingredients made in Australia	49
Some ingredients made in Australia	56
Product processed in Australia	68
Product packaged in Australia	74
Product of Australia means:	
All ingredients made in Australia	61
Some ingredients made in Australia	48
Product processed in Australia	71
Product packaged in Australia	73

Of the three terms currently used by manufacturers on their labels, 'Product of Australia' instilled the most confidence in the source of the ingredients; nearly two thirds of the people surveyed took it to mean that all the ingredients were made/grown in Australia.

WHAT THEY REALLY MEAN

Unfortunately this confidence is misplaced. In fact the terms are legally interchangeable, and don't necessarily reflect where the raw materials of a product originate. While a food product has to carry some kind of label about its origin, the present regulations mean this label can be misleading. As long as some part of the production process which changed the "essential characteristics" of the product (turned peanuts into peanut butter, for example) took place in Australia, the product can carry the label 'Made in Australia' (or any of its variations); the raw materials don't have to originate here. This means consumers who want to buy food grown as well as processed or packaged in Australia are not helped by the present labelling regulations.

Some manufacturers take the initiative beyond the regulations and provide labels such as 'Manufactured in Australia from [ingredients] imported from [country]'. This is much more helpful for consumers.

Once people realised the terms are interchangeable — and tell you nothing about where the ingredients really come from — there was strong agreement that there should be only one term used to convey Australia as the country of origin, and that if it used the word 'Australia(n)' it should only apply to a product that was *wholly* Australian — grown, manufactured/processed and packaged here. As one person summed it up: "If it says it's Australian it should be."

Nearly a quarter of the people surveyed rejected the three terms currently used, and offered alternatives, often including 'totally', 'wholly' or 'fully', to indicate a product was 100% Australian.

WHY DOES IT MATTER?

How a product's country of origin is labelled is of little interest if people don't care whether they buy Australian or not.

It seems most people do. Eighty two per cent of the people surveyed thought where a product came from was important. Sixty eight per cent said they try to buy Australian whenever they can, while another 19% said they sometimes try to buy Australian. Significantly, nearly two thirds of those who gave a reason for this said it was 'wanting to help the economy': as one respondent put it, "Keep our money here."

We introduced the price factor and asked those who said they always or sometimes tried to buy Australian (87% altogether) whether they would still do so if the imported product was cheaper. Almost half of these people gave a qualified response such as 'depends how much cheaper'.

The rest gave a more definite answer: only 12% said they would buy the imported product, while 40% said they would still buy the Australian product.

Generally speaking, the older people were, the more patriotic they felt towards Australian products, and the less important price was.

What consumers want

It seems many consumers are keen to buy Australian products, yet the present labelling regulations don't give a clear idea of just how much 'Australia' there is in a product. Consumers want a single term that unequivocally states the product is *wholly* Australian. As a member of the Food Policy Alliance (a coalition of consumer, farmer/grower and trade union organisations), the Consumers' Association is campaigning to restrict the looser use of the terms 'Made in Australia', 'Australian Made', 'Product of Australia' and 'Produce of Australia'. These terms should mean what people think they mean: food grown here, processed here and packaged here.

If food is not grown here, labels could specify what Australian content the product has: 'Manufactured in Australia', 'Processed in Australia','Packaged in Australia', 'Bottled in Australia', for example. These terms should always carry a rider explaining the origin of the raw ingredients or significant components — for example, 'Manufactured in Australia from [ingredients] imported from [country].

Other recent research into consumer attitudes has shown consumers believe an increasingly wide range of Australian-made products are of good quality, and that they want to buy these products and support local manufacturers. While the CHOICE survey used food products as an example, it's clear any 'Australia' labelling regulations should cover other products too. ❑

ANNOUNCING

THE 7TH CHOICE SUBSCRIBER DRAW

For new CHOICE subscriptions and renewals received 1 January to 31 March 1992.

On 4 April next year, we'll be holding our seventh Subscriber Draw. The lucky winner will be able to choose any two products from the following tests published July 1992 to September 1992.

☐ Cellular phones (July '92)
☐ Electric frypans (August '92)
☐ Colour televisions (July '92)
☐ 300-350L refrigerators (September '92)

These are products we bought for testing (we never take manufacturers' samples), so you won't be the first to turn them on or set them up. But we'll cover any service problems with a CHOICE warranty that'll match the manufacturers' — just as if you'd bought them new.

All new CHOICE subscriptions and renewals received from members and personal subscribers (including donors of gift subscriptions) by 31 March will go into the Draw, unless of course you indicate you don't want to be included.

(If you're not due to renew your subscription during the period, don't worry, we'll be holding other Draws during the year — your renewal notice will have the details.)

THE PERFECT GIFT

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And every new CHOICE subscription you give or renew for someone else means an extra entry for you in the Subscriber Draw. Give two gifts, gain two extra entries. Give three, and you've tripled your chances.

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CONDITIONS OF ENTRY

1. The winner will be drawn from new subscriptions and renewals from personal subscribers (including members and donors of gift subscriptions) received 1 January to 31 March 1993. If you renew or subscribe for 2 years, you get 2 chances to win.
2. Information on how to enter and prizes form part of these conditions of entry.
3. Employees, and their immediate families, of the Australian Consumers' Association and its associated companies and agencies are ineligible to enter.
4. Entrants must be residents of Australia.
5. Applications are subject to a verification check and judge's decision is final. No correspondence will be entered into.
6. The prizes will be delivered free anywhere within Australia.
7. Prizes cannot be taken as cash.
8. South Australian residents may enter the draw by completing the form and posting to Reply Paid No. 13, ACA, 57 Carrington Road, Marrickville NSW 2204, without subscribing to the magazine. Only one enetry per person is permissible through this method.
9. Last date for receipt of entries to the Draw is 31 March 1993. No responsibility accepted for lost, late or misdirected mail.
10. The draw will be conducted at the office of the Consumers' Association at 10 am on 1 April, 1993.
11. The winner will be notified by letter and published in the June 1992 issue of CHOICE magazine.
12. The promoter is Australian Consumers' Association, 57 Carrington Road, Marrickville NSW 2204. NSW Permit No. TC92/5245, VIC Raffles & Bingo Permits Board Permit No. 92/3210 issued on 24/11/92, ACT Permit No. TP92/1956 issued under the Lotteries Ordinance, NT No. NT92/1600.

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CHOICE LINES

Consumer Rights Advice

CHOICE operates consumer rights lines t people having problems with a faulty pr duct or a dispute with a service person. Th lines set out what your basic rights are an what steps you can take to protect the These lines are also available in four la guages other than English — Vietnames Arabic, Chinese and Turkish.

CHOICE Consumer Rights Advice: **0055 200**
Advice in Vietnamese: **0055 200**
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Youth lines

A line specifically for young consumers, t 'Ripped-off' Line, outlines your shoppi rights as well as letting you know what y can do if you run into problems with som thing you have bought.

Students can also call a resource line find out where to get up-to-date informati on the consumer movement and the e vironment. These two topics are the mo requested by students and teachers who ri our Consumer Information Service.

CHOICE 'Ripped-off' Line — Advice f Young Consumers: **0055 200**
CHOICE Student Resource Guide: **0055 200**

Product advice

A number of product lines also summari what to look for when you are buying particular product. Brand-name recomme dations aren't included, however — the remain exclusive to CHOICE subscribers.

CHOICE Washing Machine Advice: **0055 200**
CHOICE Water Filter Advice: **0055 200**
CHOICE Baby Products Advice: **0055 200**
CHOICE Safer Domestic Pest Control Advice: **0055 200**

Other lines

A media 'hotline' provides immediate ar accurate background information on co sumer issues being reported in the new media, while a 'suggestion line' gives you chance to say what you would like to se tested or researched for publication CHOICE.

CHOICE Media 'Hotline': **0055 200**
CHOICE Suggestion Line: **0055 200**

Calls attract a rate of 55 cents per minute

CAR EMISSIONS

A VICTORIAN STUDY has found 50% of car emissions are coming from just 13% of the total fleet, and recorded emissions from cars running off liquefied petroleum gas (LPG) as being nearly twice as high as for cars running off petrol. The report, by the Royal Automobile Club of Victoria (RACV) and the Victorian Automobile Chamber of Commerce (VACC) in consultation with the Environment Protection Authority (EPA), nominates a few possible reasons for this:

- LPG conversion often involves bypassing an efficient fuel injection system with a crude carburettor.
- The low price of LPG reduces the incentive to maintain correct engine tuning.
- The power reduction generally inherent with LPG often means the engine is tuned for performance rather than economy or low emissions.

Not so surprising was the finding that older cars tend to have higher carbon monoxide emissions. A marked improvement can be seen from 1986 models on, when catalytic converters were made mandatory on all new cars.

The report also says the current roadside emissions tests for cars are not providing reliable evidence of a vehicle's emissions while it's actually on the road. The results have prompted the RACV and the VACC to say there is an urgent need for a quick and economical on-road test of motor vehicle emissions.

The study included tests of a remote sensing device that measures car emissions as they drive by (see *Drivelines*, July 1992). The device proved to be effective for measuring carbon monoxide emissions across the whole fleet, but wasn't effective for hydrocarbon emissions. And it can't read nitrogen oxides, the major smog-related pollutants.

VACC executive director Bob Davison said the only reliable means of checking a vehicle's compliance with emissions standards is a dynamometer. However, these are expensive and not suited to random roadside vehicle checks. "With awareness of environmental concerns increasing, there is an urgent need to develop a test which combines to some degree the convenience of the research device we used with the comprehensive capability of the permanent dynamometer installation," he said.

... AND SOCIAL JUSTICE

ONE PROBLEM with targeting the emissions of older cars is the cost of rectifying these problems when many people who own them are on lower incomes. The National Roads and Motorists' Association (NRMA) and the Australian Council of Social Service (ACOSS) tackled this problem recently in a draft policy discussion paper.

It says any long-term policies on strict emission controls must include offsetting measures for people on low incomes, such as access to cheaper forms of car maintenance and repair, sales tax concessions for fuel-efficient vehicles and provision of alternative forms of transport.

The paper says the Commonwealth Government's Building Better Cities program and Ecologically Sustainable Development policies are a good basis for developing future transport policies. But while it's easy to come up with idealistic proposals that do away with the car completely, its benefits are undeniable. "Without it, many people would be isolated, would be forced to undertake unsafe journeys, or simply would not be able to access important opportunities such as employment," the report says.

It highlights the need for transport policy makers to pay special attention to the needs of low-income households and the impact any policy might have on them.

SECONDHAND WARRANTIES

THE COMPULSORY WARRANTIES given by secondhand car dealers in South Australia have effectively been lowered by the state's new consumer affairs minister, Anne Levy. The new warranties came into effect from the end of November last year. The table below summarises the changes.

Secondhand car price	MINIMUM WARRANTY Before changes	After changes
0–$999	Nothing	Nothing
$1000–$1999	1 month or 1500 km*	Nothing
$2000–$2999	2 months or 3000 km*	Nothing
$3000–$5999	3 months or 5000 km*	2 months or 3000 km*
$6000 and over	3 months or 5000 km*	3 months or 5000 km*

* Whichever comes first.

Ms Levy said, "These price levels have not been reviewed since 1985. They are now being brought into line with other states like Victoria."

The South Australian Office of Fair Trading claims the majority of cars under $3000 are over 15 years old; since cars of this age are exempt from any warranty, it reckons most sales won't be affected by the changes.

We suggest you think twice about any car that looks like a bargain at $2999.

DRIVEN ROUND THE BEND

A BIT OF GOOD NEWS from the Australian Bureau of Statistics (ABS). Its latest survey of motor vehicle usage in Australia has found we're driving less than in 1988 and so our consumption of fuel has dropped slightly.

While the number of cars on our roads increased over the period, the distance travelled by the average passenger car fell from 15 800 km in 1988 to 14 300 km in 1991, leading to an overall drop in fuel consumption. The ABS found cars in Tasmania drove the least distance on average (12 200 km/year), followed by SA (13 400), NSW (14 000), Victoria (14 200), WA (14 700), Queensland (14 900), NT (16 100), and bringing up the rear was the ACT (16 800).

Around one quarter of the distance travelled by passenger cars was getting to and from work. Another quarter was driving on work business, while half was taken up by private use.

Just think, if your children can average one "Are we there yet, mum?" for every kilometre you drive you could hear that question many thousands of times a year. Frightening, huh? ❑

breast cancer

If you're a woman, breast cancer is the cancer you're most likely to get. We look at what you need to know about this disease, and the latest on treatment.

BREAST CANCER has been big news over the past 12 months. Headlines have trumpeted good news about a drug called tamoxifen, both promoted and cast doubt over the usefulness of breast self-examinations and mammograms (breast x-rays), and questioned use of the contraceptive pill as a possible risk.

At the same time, the number of women diagnosed with breast cancer is increasing. Throughout the world, an estimated 250 000 women die of it each year. In Australia, it's the third biggest killer of adult women.

It's little wonder women are confused and fearful about this disease. While it may be tempting to bury your head in the sand, at the moment the most positive step you can take to protect yourself is improving your awareness of it. You can't prevent breast cancer, but earlier detection and treatment greatly improve the chances of surviving and of achieving the best cosmetic result.

If the tumour is caught early it's less likely to have reached the stage where it has spread to other parts of the body. It's also likely to be small enough for a partial mastectomy to be a treatment option. But according to Professor Langlands, spokesman on breast cancer for the NSW Cancer Council, "We still see women who have left a lump for several years, often with disastrous consequences."

He says women need to know, "The chances of survival for every tumour are related to the size of the tumour at presentation." The proportion of women alive 15 years after treatment for a 2 cm breast tumour is twice that of those treated for a 5 cm tumour. Similarly, the chances of the cancer having spread to the lymph nodes in the armpit (an indication it has also begun to spread to other parts of the body) are related to size. With a 2 cm tumour there's a one in three chance of lymph node involvement, whereas with a 5 cm tumour it's a two in three chance.

Dr Paul Crea, a surgical oncologist and co-ordinator at Sydney's St Vincent's Breast Assessment Centre, is concerned some women are getting the wrong impression about breast cancer treatment. "The message women are getting is that they should have a bit of a feel now and again and if they find a lump it can easily be removed by minor surgery and then everything is fine. This is a disturbing situation that worries me." Inappropriate information and unrealistic expectations make it harder for women to cope with a diagnosis of breast cancer, and can lead to inappropriate treatment that causes great suffering.

A quick survey we did of women attending the Sydney Square Diagnostic Breast Clinic suggests that while some women are well-informed about breast cancer, the majority are not. For example, most did not know at what age it was appropriate to begin to have regular mammograms taken, some suggesting as young as 14. In the following pages we have tried to answer the most common questions women ask about breast cancer, its causes, treatment options and prevention.

Any woman can develop breast cancer — while some have slightly higher risk factors, most women who get it don't fall into a known risk category. We don't know how to prevent it, so early detection and treatment are vital.

How likely am I to get breast cancer?

The average risk of an Australian woman developing breast cancer over her lifetime is about one in 14 or 15. A range of factors seems to increase this risk — such as starting to menstruate early, late menopause, being significantly obese, and having a high-fat and low-fibre diet — but only slightly. The most significant risk factor is a family history of breast cancer. Women whose mother, sister or daughter had the disease, especially if it developed before menopause or in both breasts, are more likely (but by no means certain) to get it. Factors which seem to make it less likely include giving birth at an early age (before age 20) and breastfeeding.

The average age of women diagnosed with breast cancer is 56, but it does occur much earlier than that. It is rare in women under 30.

If I don't fall into a higher-risk category, can I stop worrying?

No. All women are at risk of developing breast cancer. In most cases it appears to occur randomly: only around 30% of women who get the disease fall into any of the known risk categories. For example, the majority of women who develop breast cancer have no family history of the disease. By the same token, if you do have one or more of the risk factors you won't necessarily get cancer.

What causes breast cancer?

We don't know the precise mechanisms and factors which lead to cells within the breast becoming cancerous, but it seems that somehow the sex hormone, oestrogen, is involved. Along with progesterone, this hormone helps regulate cell growth and division in the breast. Most of the known risk factors are related to an increased exposure to oestrogen. A longer than average menstrual history means a woman has had high levels of oestrogen in her body over a longer time. By suspending the menstrual cycle, pregnancy and breastfeeding reduce a woman's lifetime exposure to high levels of oestrogen. Women with significantly more body fat will produce more oestrogen. Dietary fibre has been found to lower the levels of oestrogen in the blood, so it follows that women with a low-fibre diet have higher levels. Men, who have much lower levels of oestrogen than women, rarely get breast cancer.

However, the most likely explanation is that a combination of factors, including genetic predisposition, leads to cancer.

Does the pill or hormone replacement therapy (HRT) increase the risk?

A recent Queensland study, which reviewed all important breast cancer research published since 1981, found that the vast majority of research revealed no evidence that either the pill or HRT affected the overall risk of breast cancer significantly, even when used over a long time. There were some conflicting findings, however, and question marks remain over the risk for particular groups. Several studies indicate there may be an increased risk in young women who use the pill for a long time and start before age 25. Further research is needed to confirm or deny this concern. Another study suggested oral contraceptives may promote growth of existing tumours rather than trigger their development. With hormone replacement therapy, there may be a small increase in risk for women with a family history of breast cancer.

Based on current evidence, it seems women and their doctors have to weigh the risks against the benefits of these medications in their own individual circumstances. For many women, it is likely the benefits would be greater.

You can't prevent breast cancer, but earlier detection and treatment greatly improve the chances of surviving and of achieving the best cosmetic result.

What can I do to protect myself?

There's nothing specific you can do to prevent breast cancer. The best thing is to direct your efforts towards early detection and early treatment:

- Examine your breasts yourself every month after your period — ask your

doctor to show you how to do this properly. You should start when you're around 25.

- If you notice any change in your breast tissue, consult a doctor straightaway.
- Get your doctor to examine your breasts once a year — at the same time as you have a pap smear is a good idea.
- Start having regular mammograms at the appropriate time (see below).

A healthy diet and lifestyle won't guarantee you won't get breast cancer, but are still a good idea. The advice is pretty much the same, whatever health problem you're trying to avoid: eat a balanced diet that's high in fibre and low in fat; learn strategies for managing stress; exercise; and don't smoke or drink too much alcohol.

What should I do if I feel a lump in my breast, or have other suspicious symptoms?

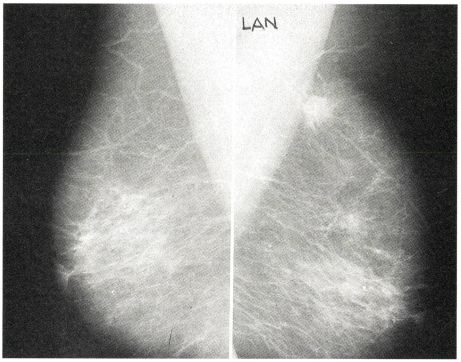
Lumps are the most common breast symptom but there are others, including discharge from the nipple, dimpling or puckering of the skin, unusual asymmetry (for example, if one breast begins to change shape) and persistent or unusual pain in one breast.

If you have any of these symptoms, don't panic — most things women feel or find in their breasts turn out *not* to be cancer. According to Dr Joan Croll of the Sydney Square Diagnostic Breast Clinic, of nearly 10 000 women who came to the breast clinic because they had a symptom, only 4% had cancers. Around 20% were found to have cysts, and the rest proved to have some other benign problem or simply normal glandular tissue.

But do have the symptom checked out thoroughly by a doctor straightaway. In most cases, you'll be reassured that nothing is wrong: sometimes immediately, without needing a mammogram, sometimes after further investigation. If it is cancer, the earlier you have it treated the better.

Why is breast self-examination important?

Both Dr Crea and Professor Langlands believe most women misunderstand the purpose of examining their own breasts. It is not to find cancer. "The reason for self-examination is to become totally accustomed to what is normal for her, so that hopefully she will become quickly aware of a change," says Dr Crea. Like regular mammograms, it is not a preventive strategy, but a tool to assist in early detection. To be effective, it must be done regularly, and changes investigated by a doctor as soon as they're noticed.



A mammogram is an x-ray of the breast tissue: abnormalities show up as white lesions or collections of white specks. It takes a lot of experience to read a mammogram properly.

When should I start having regular mammograms?

There's some disagreement about this. You should definitely start having mammograms at 50, and have one at least every two years. There is a lot of evidence that regular screening of women in this age group reduces the death rate from breast cancer significantly. Some people believe you should start at 40, have one every year until menopause, then every two years from then. However, there's no statistical evidence that routine screening of women aged 40 to 50 reduces the death rate.

If your mother or another close relative had breast cancer, you should start regular self-examination at 25, and discuss with a doctor or specialist when you should start having regular mammograms.

How reliable are mammograms?

For women over 50, mammograms are very accurate, provided they are taken by experienced radiographers on a machine specifically designed for breast x-rays. According to Dr Croll, they are four and a half times more accurate at identifying women who are clear of cancer than examining the breasts with fingers, and can reveal cancers before they're large enough to be felt. They can also show up micro-calcifications, which indicate early-stage cancer where malignant cells have spread along the milk ducts in the breast, but have not begun to invade the breast tissue. This kind of cancer can't be detected any other way and is considered to be curable if caught this early. Also, some breast cancers "do not present as a 'lump', but as a vague thickening which may be soft or tender. Sometimes discomfort or 'awareness' of one breast is the only sign that a cancer is present. Mammography can also detect these cases," says Dr Croll.

In younger women they are less reliable. Women under 50 usually have denser breast tissue, so cancers are less likely to show up on x-rays. They can be used in combination with other diagnostic techniques if a woman has symptoms but, because breast cancer is less common in this age group, annual screening is not considered particularly useful.

Although it is the most accurate test available, mammograms won't pick up all cancers present. They can give a false negative reading in up to 10% of cases for several reasons, including human error and the location of the cancer in your breast. If you have a lump or other breast symptom, never rely on a negative mammogram. The symptom must be investigated and explained before cancer can be ruled out.

Are mammograms safe?

The degree of irradiation from modern mammographic machines is much less than from those used in the '60s and '70s. A yearly mammogram for women over 50 is not considered to be a safety risk at all.

If a mammogram shows something abnormal, what then?

If your mammogram shows up something suspicious, you'll usually be asked to come back to have additional mammographic views taken, and sometimes ultrasound is used. These will provide additional information, and clarify whether the matter needs further investigation.

If it does, a biopsy will be done to find out if the tumour is cancerous. This involves taking some tissue from the lump and analysing it. In some cases, this can be done by inserting a fine needle into the lump and withdrawing some cells. Where once you'd have waited anxiety-ridden days for the verdict, with this method you usually find out if they're cancerous or not within hours. In other cases, surgery is required to get a sample of cells. Typically, this means a day in hospital and results within 48 hours.

If it is cancer, what happens?

The classic horror story is of the woman who finds a lump and is rushed into hospital to have a biopsy performed; before she goes under the anaesthetic she signs a consent form to say if cancer is found the surgeon can perform a mastectomy on the spot, and wakes up to find her breast is gone. This sort of whirlwind treatment shouldn't and usually doesn't happen today. Says Dr Crea, "There's no statistical evidence that delaying treatment a week or two weeks does any harm." A good doctor will talk to you about your diagnosis and its implications, the options for treatment and their implications, and give you time to digest and discuss this information.

Which treatments will be appropriate for you depends very much on your particular cancer. The variety of ways breast cancer can develop means what was best for your neighbour's friend won't necessarily be best for you. Factors such as the size and location of your tumour and the size of your breasts will be important, as will your age and personal circumstances. If you're not happy with the first advice you get, seek a second opinion.

Can it be cured?

Long-term survival doesn't seem to be closely related to the kind of surgery a woman has. It depends more on whether or not the cancer had metastasised — the process by which the original tumour sheds microscopic cancer cells which can travel to other parts of the body — before it was removed. If it hadn't, any operation which adequately removes the cancerous area will 'cure' the disease.

If it had metastasised, the shed cells may develop into secondary cancers some time in the future, most often in the bones, liver, lungs or brain. However, the amount of time it takes for this to occur varies enormously. Sometimes they don't develop for a long time — 10 or 20 years, even up to 30 years after the primary cancer was treated. Additional treatments such as chemotherapy or hormone therapy — aimed at killing shed cancer cells in distant parts of the body — have been found to improve the recurrence-free survival time.

Whirlwind treatment shouldn't and usually doesn't happen today. "There's no statistical evidence that delaying treatment a week or two weeks does any harm."

Is surgery always necessary?

The purpose of surgery is to clear the breast itself of any evident cancer and prevent it recurring. There is no other way of doing this. Women who don't have surgery or have inadequate surgery can suffer horribly from the disease in their breasts.

How much of the breast is removed in a mastectomy?

Today, either a modified radical or a partial or segmental mastectomy would be performed. With a modified radical mastectomy, all of the breast tissue, the nipple, and the lymph glands in your armpit are removed, but the pectoralis, the muscle which stretches from your armpit across your ribs, is usually left. It leaves a neat scar and, when you're dressed and using a prosthesis (a moulded artificial breast worn inside the bra), your appearance is normal, even in a sleeveless dress.

With partial mastectomy, the tumour and a significant proportion of the breast — usually at least two centimetres of cancer-free tissue around the tumour — and some or all of the lymph nodes in the armpit are removed. The appearance of the breast after a partial mastectomy will depend in part on the size of your breasts and the location of the tumour. If a partial mastectomy is performed you must also have radiotherapy to the remaining breast tissue.

Although the term 'lumpectomy' has become common, it very rarely means what it sounds like: breast cancer can't be successfully treated by simply removing the lump.

Which is the best operation?

In some circumstances, a partial mastectomy combined with radiotherapy to the rest of the breast is equally as effective in clearing the breast of cancer as a full mastectomy. But because every case of breast cancer is different, what's best differs too. It depends on several things, including the size and position of the cancer, the size of the breasts, and how strongly the patient feels about the options.

Says Dr Crea, "Every case has to be planned on the woman's own particular problem. You may decide to do a [full]

TAMOXIFEN: SOMETHING OF A BREAKTHROUGH

TAMOXIFEN — an oestrogen-blocking drug — has been around for 30 years. What's new is that we now have convincing evidence that it and other additional therapies increase the number of women who survive early breast cancer for 10 years without developing secondary cancers. Tamoxifen also seems to reduce the number of women developing tumours in their other breast.

Earlier this year the results of a worldwide overview of 133 trials that began before 1985 and involved 75 000 women with early breast cancer were published in the British medical journal, *The Lancet*. These findings give doctors a clearer understanding of the best treatments for different groups of breast cancer sufferers, and have suggested directions for further research.

The increase in the survival rate sounds fairly modest — for example, after 10 years 59% of patients on tamoxifen were alive compared with 53% of those who weren't — but because breast cancer affects so many women around the world this translates into a huge number of women living longer, better-quality lives.

A trial to test the usefulness of tamoxifen in preventing breast cancer in women considered to have an increased risk of developing the disease has begun.

A PERSONAL ACCOUNT

MARGARET MARY was 36 when she discovered she had breast cancer, nearly four years ago. "I still find it hard to say why I chose to have a mammogram," she says. "There was no apparent reason for having one. Initially, I went to the doctor for a pap smear test, and he was telling me about Sweden, how they have mammogram caravans there. I guess I was more conscious of it because the sister of a very dear friend of mine had died of breast cancer at 28 recently. Anyway, I decided I'd trot off and have a mammogram. I felt quite relaxed and comfortable about it — in fact, I probably even felt a bit smug. You know, 'Aren't I good, being responsible for my own health'."

When they said they'd found something — "Just a tiny group of calcifications, you can barely see them, but let's check them out" — she was taken aback, but agreed to have more mammograms, then a biopsy. When the doctor told her they had found malignant cells she couldn't believe it. "My first reaction was, 'He's lying. What a terrible thing to say to someone.'

"I remember thinking, 'What will I do ... my daughter, my husband, my life?' When I told Peter that night I felt I was falling into a vortex, I couldn't think. I remember saying to myself 'Oh God, on top of all this, I'm going to have a nervous breakdown.' I felt so confused, I had very little information then. We sat there talking and Peter asked me 'What's the worst thing that could happen?' When we'd said it — dying — I began to feel that I probably could cope."

Margaret Mary saw the doctor again the next day and asked for more information. "When I accepted it was true, I wanted to find out what to do. I was terrified, sure I would die. The doctor

mastectomy simply because she is going away to Africa and so can't have radiotherapy follow-up; you may do a mastectomy purely because she requests it, even if the tumour is small — she says, 'I just want to get rid of the damn thing'; or you may decide not to do one because she refuses. But there are certain times when I would say, 'Look, you need a [full] mastectomy and to do anything less would be wrong.' These are usually women who have large cancers and I know they will do badly with lesser procedures."

There is some evidence that, for premenopausal women, the timing of surgery in relation to the menstrual cycle may be significant. Doctors at Guy's Hospital in London examined the records of premenopausal women treated over a 10-year period, and found that significantly more of those operated on less than two or more than 13 days after their last period were alive and free of secondary cancers than those treated earlier in their menstrual cycle. Between days three and 12 the body is secreting only oestrogen, whereas during the second half of the cycle both oestrogen and progesterone are secreted. It's possible that cancer cells left behind after surgery might have a greater chance of surviving and reproducing themselves when only oestrogen is being secreted.

What are the other treatment options?

Soon after surgery for early-stage breast cancer, additional treatment, known as adjuvant therapy, is often given. Its aim is to kill off any cancer cells which might remain in the body. These metastases are microscopic and could have entered the bloodstream or lymphatic system. It's not possible to know for sure this has not occurred. An important indicator is the condition of the lymph nodes under the arm. Some or all of these are removed during initial surgery and examined. If there is no sign of malignant cells here there is a good chance the cancer hasn't spread yet, although it's no guarantee. If they are present the tumour must have metastasised. The number of nodes affected indicates how likely it is cancer cells have spread beyond the nodes, and influences what additional treatment would be appropriate.

Several different adjuvant therapies have been found to improve both the cancer-free and overall survival rates of women diagnosed with breast cancer:

■ **Chemotherapy.** This involves drugs, usually given intravenously, which attack cancer cells and stop them dividing and growing and can completely destroy them. It seems to work best for premenopausal women with only a few lymph nodes showing signs of cancer, although other groups show some benefits too. It usually lasts for six months and, because the drugs also attack healthy cells, has unpleasant side-effects. It induces menopause (sometimes temporarily) in younger women.

■ **Hormone therapy.** As the hormone oestrogen seems to play a significant role in the development and growth of tumours originating in the breast, drugs that alter the behaviour of hormones produced by the body are used to try to stop cancer cells carried to other parts of the body in the bloodstream or lymphatic system from growing.

The most common drug used is tamoxifen, which prevents oestrogen from coming into contact with cancer cells and promoting their growth. It has fewer adverse effects than chemotherapy, and is most effective on cancers with 'oestrogen receptors' (which means they are extremely sensitive to oestrogen); tumours removed from the breast should be examined to determine this. It also seems to be of most benefit to postmenopausal patients. In premenopausal

explained in detail, and said in my case he thought a mastectomy would be best. At first I thought why should I lose the whole breast, when it's only a little collection of specks. The doctor was very good at discussing the options, at explaining why this was better than that. I also asked for reasons and explanations.

"Within a day or so I had decided I wanted it done. I kept thinking of the cancer as an octopus creeping through my body. I wanted to get rid of it. The following week I had the mastectomy. After that I had chemotherapy. The doctor recommended it, but it was my choice. I saw cancer very much as an enemy within my body and I wanted to blitz it.

"I was back at work four weeks after the mastectomy. Chemotherapy was horrendous. I had an injection every fortnight for six months and was taking tablets as well. I was vomiting and retching all day after an injection. I had them on Thursday afternoons, had Friday off work and by Sunday I'd feel OK again.

"I lost most of my body hair, but as I'd bought a wig before I started losing my hair people didn't realise. It was good knowing most people didn't know. Apart from ballooning in weight, I didn't have any other side-effects. Within two weeks of finishing chemo my hair started growing back. Although it was awful, it was only six months. I saw it as an investment in life.

"For the first year after my mastectomy I was so preoccupied with the fear of the cancer recurring and coping with chemotherapy that the loss of my breast was a fairly minor issue. I was very nervous about seeing myself after they took the bandages off. But it wasn't so bad. I didn't feel mutilated, I didn't feel ugly. My scar was very neat, and still is. That's not to say I'm not sad that I've lost my breast. Not a day goes by that I'm not aware of the loss. But I've been given this chance at life and somehow it would seem an utter waste if I spent it focusing on loss, so I keep this thought up front. My husband was good and said to me, 'Look, I didn't marry you for your left breast.' I often think that now, 'I am not my left breast.' I know a lot of women have a much harder time than I did accepting the loss.

"But the more distant the fear of dying becomes, the more conscious I'm becoming of the cosmetic. I've thought about reconstruction, I still think about it.

"Although I don't want to minimise the experience — it was terrifying and really hard sometimes — I have lived through it, I have coped. At the time I had so much love and support from the people around me; that seems to have stayed with me, and given me strength and confidence. I know it sounds funny to say this, but I actually had one day when I felt almost glad it happened. It's made me assess my life. I still get het up about little things, but I pull myself up now, I'm more prepared to take some challenges, to apply for jobs, to do things that I wouldn't have otherwise. I have a greater understanding of the haphazard nature of life and know I don't want to put things off and waste my life. I still do, of course, but much less than I used to.

"I still get scared, but that's getting less too. One of the best things I did was go to breast cancer support group meetings. That was fantastic, it really put things in perspective. Two women in the group had mothers with breast cancer who had lived to be hale and hearty 85-year-olds. I suddenly realised it's not necessarily a death sentence. Later I heard about three or four other women that friends knew who had died 50 or 60 years after they discovered breast cancer. It's given me courage.

"When I agreed to do this interview, one of the things I thought was if I don't talk about it, is it saying I am ashamed of having had breast cancer? I think it's very important not to think it's shameful."

women it induces menopause, and side-effects associated with this (such as increased risk of osteoporosis) are likely for all women. See *Tamoxifen — something of a breakthrough* on page 21 for more information.

Premenopausal women were once treated by destroying the ovaries by surgery or radiation, but this practice declined with the development of chemotherapy and oestrogen-blocking drugs in the '60s. The benefits are now being reconsidered, and trials are under way to compare its effectiveness with chemotherapy and with both treatments together.

■ **Radiotherapy**. As well as being used as part of the primary treatment in conjunction with partial mastectomies, radiotherapy is also sometimes used as an adjuvant treatment. This is usually when there is a high risk that mastectomy hasn't been able to remove all malignant cells around the tumour (for example, if it was attached to the muscles over the ribs). It has some side-effects, particularly tiredness, and requires visits to hospital for treatment.

Chemotherapy and radiotherapy are also used to treat advanced cases of cancer, when they can alleviate symptoms and prolong life by causing the cancer to go into remission.

Do I have any choice about the treatment I receive?

There is some degree of choice, and your doctor should discuss the options with you, their pros and cons, and explain why they are or aren't appropriate for you. A good doctor will ask about your feelings, preferences and circumstances and involve you in the decision-making if you wish. Not everyone will want to, but women who do participate in the decision about their treatment seem to cope better with it.

Is breast reconstruction an option?

It is still an option, and can be undertaken at the time of initial surgery or, preferably, six to 12 months later. There are several ways it can be done, using skin, fat and muscle tissue from other parts of your body or a silicon gel implant. The full safety implications of silicon implants are still unknown. Nipple reconstruction can also be done.

It is not an easy operation. The result can look good, but certainly not always and it won't look exactly like the breast lost. Says Dr Crea, "If a woman is iffy about whether to have a reconstruction or not, she really has to think hard before going into it. It's not just a simple thing." Find out exactly what's involved and get a realistic idea of what you could expect the results to look like before making a decision.

How will breast cancer change my life?

Like all major challenges, breast cancer will change your life. There's a great deal of stress and fear at the time of diagnosis and throughout treatment. One of the hardest things to deal with is the knowledge there is always a risk the cancer will recur. For many women, losing a breast is very sad and difficult to adjust to. Anxiety that it will damage self-image, sexuality and relationships is very common.

But, after a period of grieving, women do adjust. The doctors we spoke to said that, in their experience, good relationships seem to grow stronger. Fears and anxiety will be easier to deal with if you share them with those who love you. There are also counselling and support services available all around Australia — ring the Cancer Council in your state to find how to contact them. Emotional and psychological support is very important: not only does it help you cope, it may improve the chances that the cancer won't recur. ❑

SAFE IN THE SHADE

Do sun-safe clothing and shade materials provide the level of protection you need from harmful ultraviolet radiation?

DO YOU consider yourself a sun-smart Australian — someone who never goes to the beach without slip-slop-slapping? Have you planted shade trees in your garden and gone to the trouble of covering the pergola in shadecloth? Perhaps you've even purchased clothing labelled as providing protection from UV radiation. For all the money and energy you've expended, can you be confident you're getting the level of UV protection you need?

How can clothes, hats and other shade materials be used to provide protection from harmful UV radiation, and what are some common misconceptions about the job they do?

Why all the fuss about sunshine?

Statistics about the high incidence of skin cancer in Australia explain our increasing national concern with sun protection. Two out of three people in Australia will develop at least one skin cancer during their life. This is the highest rate in the world, and is caused, very largely, by over-exposure to the sun. About 1000 people will die of skin cancer and about 140 000 new cases will be treated this year. No skin type is immune to skin cancer, but fair-skinned people are at greater risk than olive-skinned people.

Common skin cancers seem to result from a build-up of the effects of sunlight over many years. You don't need to get sunburnt to develop common skin cancer — you just need to be in the sun often, without protection. Melanoma, the less common but more serious skin cancer, on the other hand, seems to be related to short exposures of intense sunlight, such as summer holidays which may include sunburn. Every case of severe sunburn in childhood increases the risk of melanoma in later life.

The sun does not need to feel hot to damage your skin. The damage is done by the ultraviolet radiation (UVR), which is not related to temperature. You cannot see or feel UVR but it causes sunburn, eye damage and skin cancer. December, January and February are the months which traditionally have the highest UVR levels, which means they are the highest-risk months for sunburn.

Slip, slop, slapping

We may have the highest incidence of skin cancer in the world, but the disease can be prevented by taking simple steps

Protection factors — SPFs, UPFs and FPFs: Without protection your skin might begin to redden after 10 minutes in the sun. If you were wearing a sunscreen with a sun protection factor (SPF) of 10 or a shirt with an ultraviolet protection factor (UPF) or a fabric protection factor (FPF) of 10, you would be able to stay out in the sun 100 minutes (10 x 10 minutes) before your skin started to redden. Keep in mind you don't have to get sunburnt to get skin cancer — the disease is caused by your cumulative exposure to UV radiation over your lifetime. The difference between the levels of protection offered by sunscreens and clothing is that the sunscreen can be wiped, sweated or washed off, decreasing the amount of protection you receive, whereas the level of protection provided by a garment stays constant as long as it's dry.

to reduce sunlight exposure. As far as possible, stay out of the sun between 11 am and 3 pm (daylight saving time) when ultraviolet radiation is strongest. When outdoors, the key to protecting your skin is to put a barrier between it and the sun's rays. Ideally this should be a physical barrier such as shade from a tree, building, umbrella or shade structure, a hat and clothing. Wearing a maximum-protection SPF 15+ sunscreen is another important preventative measure. See *Steps to a sun-safe lifestyle* on page 26 for an overview of the best ways to reduce your exposure to UVR.

If using shade and wearing protective clothing and hats are to be your first line of defence against exposure to UVR, what sort of shade and clothing should you use and how reliable are they as sources of protection?

Dressing to protect

Most people are already successfully using clothing for sun protection. A question asked in an Anti-Cancer Council of Victoria (Morgan) survey found that less than 2% of those surveyed had recalled being sunburnt through clothing. This study indicates most clothing offers a high level of protection against UV radiation.

When shopping for clothing, to ensure good protection from UVR look for closely woven fabrics that you can't see through if you hold the garment up to the light. Dark colours provide better protection than light colours, but they also absorb the heat-giving rays of the sun and so tend to be less comfortable to wear in hot weather than light-coloured clothing.

The design of the garment is a very important factor in protection against UVR. Shirts with a collar to protect the neck and long sleeves offer better protection than those without. Elbow-length sleeves offer an acceptable compromise between long and short sleeves. Long trousers and skirts again offer the best protection, although knee-length shorts and skirts are better than short ones.

The protection offered by many fabrics is higher than that provided by sunscreens, but you shouldn't consider yourself 100% protected from UV just by wearing clothing. The Australian Radiation Laboratory (ARL) in Melbourne has been testing the ultraviolet radiation transmission of fabrics for a number of years, and about one third of the fabrics tested fail to give an adequate level of protection, transmitting more than 5% of UVR.

There are plans to introduce a labelling system that will inform the consumer about the protection offered by the garments they purchase. No uniform national labelling system exists at this stage, but the ARL and the Department of Textile Technology at the University of NSW have both devised schemes to denote the amount of protection provided by different materials.

Table 1. The UPF scheme explained

Category	UPF range	Amount of UVR transmitted (%)	Designated UPF
HIGH PROTECTION	20–29	5–3.3	20 (for 20–24), 25 (for 25–29)
VERY HIGH PROTECTION	30–39	3.3–2.5	30 (for 30–34), 35 (for 35–39)
MAXIMUM PROTECTION	40+	less than 2.5	40+

The Australian Radiation Laboratory has tested fabrics for close to 100 manufacturers. Table 2 shows how many varieties of each fabric type have fallen into the different UPF ranges according to the ARL tests. Factors including tightness of weave, colour and weight can determine why, for instance, cotton fabric from one manufacturer will be given a higher UPF than that from another.

Table 2. Distribution of UPFs for different fabric types

UPF range	Numbers of brands with UPF in the range indicated			
	Cotton	Polyester	Lycra	Nylon
0–14	24	10	—	1
15–19	21	16	—	3
20–29	28	28	—	—
30–39	16	5	—	2
40+	48	27	19	3

The ARL scheme uses an 'ultraviolet protection factor' (UPF) and is similar to the sun protection factor (SPF) scheme for sunscreens. The UPFs are directly comparable to SPFs, in that a fabric with a UPF value of 15 would give a person the same amount of protection as an SPF 15 sunscreen, though it would do this continually whereas the sunscreen will eventually rub off. In fact, because people expect a higher level of protection from clothing than they do from chemical sunscreens, the lowest UPF granted is 20, whereas the highest SPF granted for sunscreens in Australia is 15+. Table 1 explains the UPF ratings, while Table 2 shows how many fabrics made by different manufacturers and tested by the ARL fall into each protection category.

About one third of fabrics tested by the ARL to date did not offer the minimum level of protection required to be given even the lowest UPF rating of 20. At the other end of the scale, just over a third of the fabrics tested have made it into the maximum protection category.

Unless otherwise stated on the label, the UPF rating given to a certain garment or fabric will only apply when it is dry. In general the protection decreases when the garment is wet — for example, the level of protection offered by cotton decreases by about a third when the fabric is wet. Polycotton does not absorb water well, so the UPF would only fall by about a tenth. The UPF for lycra falls too, but because this fabric offers such a high level of protection, it would still give maximum protection even when wet. Stretching and wear and tear can also have an impact on the level of protection provided by a garment.

The UNSW scheme grants 'fabric protection factors' (FPF). The protection factors given are similar to those under the ARL scheme — a major difference between the two schemes being that the UNSW results are based on human (*in vivo*) testing, whereas the ARL uses spectrophotometric testing. The teams behind both testing outfits seem to be working towards having their methodology adopted to be included in an Australian Standard for fabric testing in the future.

Should you be looking for garments with labels from one organisation or the other when shopping this summer? Naturally enough, each team claims theirs is the most accurate method of testing. In most cases the *in vivo* results confirm those achieved in non-human tests, although the UNSW results also indicate that loose-fitting clothing will provide a higher level of protection than tight-fitting. Otherwise, garments tested by either scheme should provide the protection you need.

Top it off

Wearing a hat is an important part of any sun protection strategy — hats protect

the face, ears, top of the head and back of the neck from ultraviolet radiation.

The Australian Radiation Laboratory has also tested fabrics used for making sunhats. These fabrics are given a UPF rating too, but with a qualification. Hats are usually made of more robust fabrics than clothing so the fabrics generally tend to perform well, but the overall level of protection given by the hat is dependent on its design and the wearer's exposure to reflected radiation.

A hat should stay on your head as much as possible, be comfortable and not interfere with your activities. It is no good having a hat with a very broad brim that flies off continually, or a work hat that makes it difficult to see things above your head.

A hat with a reasonably broad brim (at least 8 cm) will provide the greatest amount of shade for your face, head and neck. The next best choice is a legionnaire hat, which has a flap to protect your neck and ears but may not be quite as protective for your cheeks and lower face. Hats with narrow brims will provide proportionately less shade. A hatpin or chin strap is invaluable for windy situations.

Choose a hat made of closely woven fibre or fabric. If you can see through it, so can the sun. Loosely woven straw hats which create a dappled pattern on the wearer's face are letting through a great deal of UVR; they are not good sunhats.

Even when you're wearing a hat, some radiation will be reflected onto your face from the surrounding environment. And in some situations, the angle of the sun will mean sunlight is hitting your face, so it's a good idea to use a sunscreen for added protection.

In search of shade

Creating a more shady environment will also enhance your level of protection from UVR and skin cancer. If you have enough space, north-facing pergolas can be useful shading devices. They preserve views and expand outdoor living space. They also lend themselves readily to shading large expanses of glass or even solid walls. The sunshades attached to the pergola may be spaced battens or fixed or adjustable louvres made of timber or metal and covered with canvas, vinyl or other pliable fabrics which can be stretched over the frame during summer. When fully grown, deciduous vines trained on a pergola provide effective cooling and shade in warm weather, but allow the winter sun through.

Beach umbrellas, cabanas (tents without walls) and tarpaulins are less permanent sources of shade. For example, a beach umbrella could be used over a sandpit or to shade a sunny patio in summer. Cabanas and tents can provide shady shelters, for example by a pool. Throw a tarpaulin or a blanket over your rotary clothesline to increase the amount of shade in the backyard.

Trees with canopies provide the best shade and give you an open, safe and sun-smart backyard. Choose trees which don't drop limbs. For a small or average-sized garden, pick trees which don't develop invasive roots, and which won't ultimately grow too big for the area available. In backyards with limited space, plant shade trees with clean trunks. Plant deciduous or open-canopied trees in places where you want winter sun. Combine fast-growing shade trees and shade structures such as pergolas with slower-growing larger trees, so you have shade while the larger trees are becoming established.

It is important to use as much external shading as possible, but remember UVR bounces, like rain splashing back off a pavement, especially from reflective surfaces like snow, sand, water and light-coloured walls and paving, so you can still get sunburnt sitting under a tree or beach umbrella. Don't rely on shade alone to stop you getting burnt!

What about shadecloth?

Don't rely on shadecloth to provide protection from UVR, either, because the level of protection it offers is, in fact, quite low. Advertising claims that shadecloth offers 75% UVR protection may seem impressive, but if this level of protection is translated into a sun protection factor, shadecloth comes out with an SPF of about two to four. In other words, sitting under a shadecloth-covered pergola, without taking other precautions like wearing a hat or sunscreen, will offer little protection from UVR.

The Australian Radiation Laboratory tests shadecloth but does not grant UPF ratings for it. According to the ARL, you can purchase double-layered shadecloth which cuts transmission of UVR down to 5% (equating with a 20 UPF under the ARL's rating system). The ARL's tests have shown that the colour of ordinary shadecloth doesn't make any difference to the amount of protection it offers.

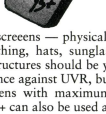
If your main reason for covering areas like pergolas is to provide protection from UVR, use tightly woven materials that cast dense shadows. The denser the shadow cast by a fabric, the more protection it offers. A tightly woven canvas, for example, gives more protection than loosely woven shadecloth.

Steps to a sun-safe lifestyle

The following list provides strategies for sun protection in order of importance.

1 The single most effective thing you can do is to reduce the time spent outdoors in the two hours each side of solar noon (11 am to 3 pm daylight saving time) when the sun is directly overhead. Sixty per cent of the day's radiation usually reaches the earth during those four hours. Not only is this the period with the greatest amount of radiation, the radiation is stronger around noon. In practice, this means you will burn more quickly than at other times of the day. Schools and workplaces should be encouraged to provide shade for use during breaks.

2 Use non-chemical protection — trees, shade structures, clothing, hats, sunglasses. But remember that even if you're sitting in the shade, you're still being exposed to indirect (reflected) radiation. It's important to wear both a hat and sunglasses — protect your head and face as well as your eyes.



3 Use sunscreeens — physical barriers like clothing, hats, sunglasses and shade structures should be your first line of defence against UVR, but chemical sunscreens with maximum-protection SPF 15+ can also be used as part of your sun protection strategy.

Research conducted by the Anti-Cancer Council of Victoria indicates most people are aware of and are using a range of strategies to protect themselves. Despite this many people get sunburnt each summer or get caught out without sun protection. Play it safe this summer! ❑

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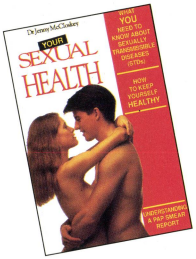
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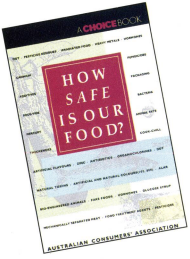

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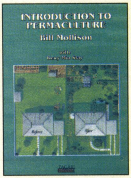

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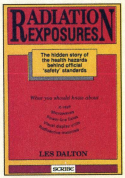

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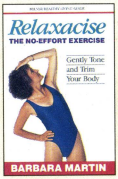

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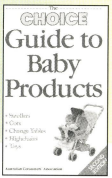

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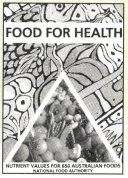

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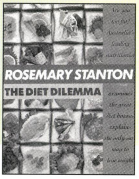

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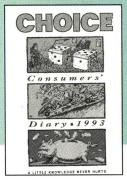

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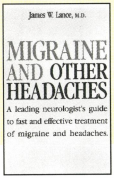
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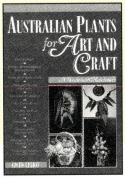

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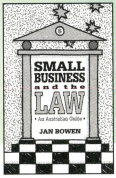

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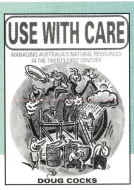


USE WITH CARE
$29.95 paperback 344pp including maps
The author, a CSIRO scientist, argues that we can manage our natural resources to balance both economic and ecological imperatives. He conveys a lot of information about the major land-use systems in Australia (and the pressures upon them) in a way that is entertaining and humane.

Your employer is required by law to provide you with a safe working environment, but when you get home you may be lying down to sleep in an environmental disaster area.

HOME SICK

IN MANY RESPECTS the air inside the home is less healthy than outside air, yet we spend about two-thirds of our time at home. And in the pursuit of worthy government energy conservation and environmental policies we are closing our homes ever tighter against the cleansing breeze.

In the great outdoors we're all familiar with pollution. It comes in large doses, like clouds of poisonous gas from industry and motor vehicles which wash over us as we jog, picnic or shuffle to the office. Eventually most disperses with the wind. You've got little or no control over it.

But it's a different story at home. Indoors the problems are largely due to tiny amounts of chemicals trapped in a closed environment of four walls, roof and floor. Here at least you do have some control over what pollutants surround you. But do you know what you're living with? And how do they affect your health?

Why worry?

Why should you worry? For a start, asthma is on the increase in Australia. Melbourne's Royal Children's Hospital estimates an increase of 140% in seven-year-olds from 1964 to 1991. More than 800 Australians die each year from asthma. Many more suffer regularly from a whole range of symptoms from headaches and respiratory complaints to skin disorders which lead to time off work or simply not enjoying life to the full.

In the US it's been estimated that indoor air pollution costs their economy US$300–$500 per person annually. Health authorities here recognise indoor air pollution represents a significant potential health risk to the Australian community.

Repetitive strain injury, chronic fatigue syndrome, sick building syndrome, — at one time there was little medical or scientific support for these problems. Will we add 'home sickness' to this list?

Warning signs

Does your home have a pollution problem? Here's a checklist of warning signs:

- Do you get frequent headaches, itchy or sore eyes, sore throats, congestion, sinusitis, skin complaints, asthma?
- Do you feel tired and lifeless?
- Does your home smell or feel stuffy?
- Is there condensation on walls and windows, in the bathroom, kitchen or laundry — even the bedrooms?
- Does water pool under or around your home?
- Is there rising damp in the walls, or mould and fungus?

Try this test: open the windows wide — does this help you feel better? Do your symptoms improve when you're away from home? If so, you've got a problem.

Is smell sufficient warning?

Some chemicals alert us straightaway to their presence: new chipboard furniture, fresh paint, mould treatments. But odour is an unreliable indicator of risk. Smells indicate *presence* not *concentration* — and are subjective anyway (you won't always notice what you're used to).

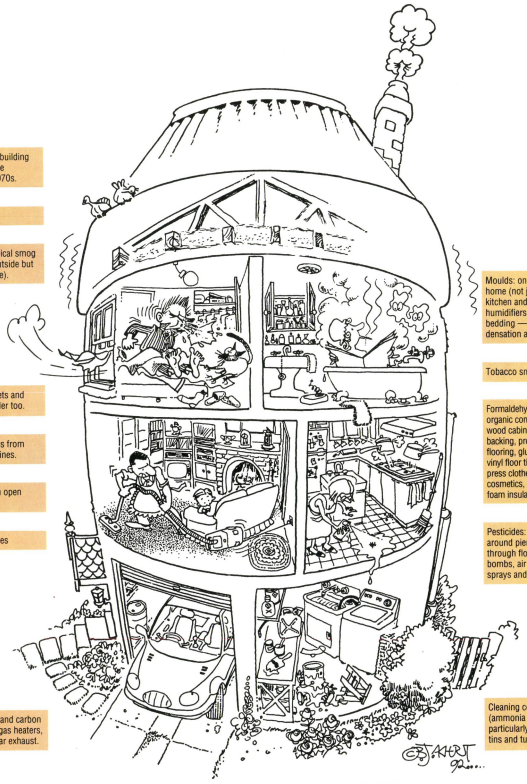
Chloroform, which can be formed in the home from chlorinated water via hot showers, can only be smelt at a concentration 25 times the desirable indoor limit. And many potentially dangerous gases, such as carbon monoxide and nitrogen dioxide (from gas cooking and heating) are colourless and odourless.

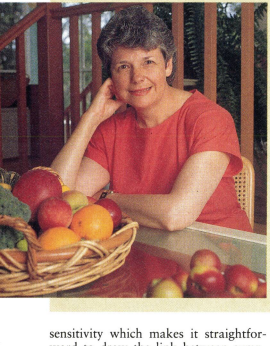
Problem chemicals

We've illustrated many of the broad categories of indoor pollutants in Figure 1 on the right. While scientists can measure them in the air, there is still much uncertainty as to whether or to what degree they are making us sick.

Some individuals have an allergy or

Figure 1. Home is like a cocktail shaker with the lid on tight.


Asbestos: used in building materials and some insulation up to 1970s.
Pollens
Ozone: petrochemical smog (comes in from outside but gets trapped inside).
Dust mite in carpets and bedding; pet dander too.
Solvents and glues from books and magazines.
Particle soot from open fireplace.
Dry-cleaned clothes
Nitrogen dioxide and carbon monoxide: from gas heaters, gas stoves and car exhaust.
Radon from ground and phospho-gypsum plaster-board, brickwork, stone, granite, concrete.
Lead: old paint peeling, contaminated soil in garden beds, from car combustion and industry nearby.
Cleaning compounds (ammonia and chlorine particularly). Half-open paint tins and turps/solvents.
Pesticides: termiticides around piers (fumes rise through floor). Indoors: bug bombs, air sprays, residual sprays and traps.
Formaldehyde and volatile organic compounds: pressed wood cabinets, paint, carpet backing, pressed wood flooring, glues (such as for vinyl floor tiles), permanent-press clothes, perfumes, cosmetics, urea-formaldehyde foam insulation.
Tobacco smoke
Moulds: on walls throughout home (not just bathroom, kitchen and laundry), in humidifiers, on curtains and bedding — due to con-densation and pooling water.



SICK AND TIRED

FOR 30 YEARS Jenny Bennett put up with unexplained pain. She was tired, lifeless and suffered from regular migraines. She knew she had a problem but, apart from her family, there wasn't a lot of sympathy.

Ten years ago Jenny reached the stage where she was sitting or lying down most of the time, and she had stopped working. Realising something had to be done, Jenny did a lot of reading about allergies and sensitivities and went to the US to see doctors there.

She embarked on an elimination diet and emptied her home of cleaning compounds, plastics and a whole range of products. "There was a massive improvement in my health after only three days. This gave me the motivation to get on with the job," said Jenny.

"I had discovered I was allergic to the dust mite. However, many years earlier I had had a scratch test for allergies but back then they didn't look for dust mite. I also found out I was sensitive to some foods and chemicals.

"As a child I had scarlet fever. My father smoked tobacco, we had a coal fire at home, and I was exposed to formaldehyde," said Jenny. "These things may have affected my immunity and led to my run-down condition."

After getting rid of many of the chemicals and substances around her home, Jenny Bennett is now much healthier and happier. She is back at work, co-ordinating the Allergy Association of Australia, an information centre and support group for those suffering from allergies and sensitivities.

sensitivity which makes it straightforward to draw the link between symptoms and substances. But most of us seem to get by quite nicely in the home environment without suddenly gasping for breath or clutching with a death grip at the jar of painkillers.

The trouble is some substances poison you or may affect your immunity over a long, slow period of development. Lung cancer induced by passive smoking and asbestosis are such cases. Others lower your tolerance, so that it takes a smaller amount than before to make you sick (formaldehyde is one of these).

And those who spend most time at home — invalids, young children, the elderly, people with chronic illnesses — are also those inherently most vulnerable to indoor pollution.

In all cases scientists are trying to work out what the measurements mean. Health effects relate not just to the presence of a particular chemical, but how much you come in contact with, and for what length of time. Your age and the local weather conditions (for example, relative humidity) will also play their part.

Several Australian organisations are struggling to set guidelines for indoor air pollution. Those working in this field include the National Health and Medical Research Council (NHMRC), the CSIRO, Standards Australia, universities, the health departments and the various state Environmental Protection Authorities (EPAs) or their equivalent. Some guidelines have been set, but it's a common complaint that research money is tight.

In the next section we'll look more closely at the problem pollutants.

Your furniture stinks

It's not always a criticism of taste or style to say that someone's furniture, carpet or curtains stink.

Many of today's furniture and furnishing products use synthetic materials, solvents, paints, lacquers and glues which rely on some wonderfully helpful chemicals to stick things together and protect against pests and decay. One chemical used in many of these ways is **formaldehyde**. It's useful but is also an irritant gas which can affect eyes, nose, throat and lungs and may lead to an asthma attack or allergic response; it's a probable carcinogen, too.

A range of substances with similar uses (solvents, cleaners, furnishings) and similar side-effects is collectively known as **volatile organic compounds**, or VOCs. Other VOCs which are classified as carcinogens include benzene (definitely a human carcinogen) and methylene chloride, chloroform and carbon tetrachloride, which are classified as potential carcinogens on the basis of animal tests.

These substances are at their most potent as air pollutants for a couple of weeks and then decline rapidly. However, your soft furniture, curtains and floor coverings will act like a sink for these (and many other) chemicals, taking them in and releasing them slowly back into the air. It's hard to get them out altogether.

Scientists have found higher levels of formaldehyde and VOCs indoors than outside. For most of the population it seems there is no great risk in having them around in such small doses, but research indicates a level of concern may be reached after new building work or renovations.

Q: In what homes do you think you'd find the highest amounts of formaldehyde? [Clue: what homes are almost entirely constructed internally of compressed wood claddings and furniture?]

A: Caravans and mobile homes. A study by the NSW State Pollution Control Commission found levels well above NHMRC guidelines in caravans and portable homes even after five years of having been open during the day. These levels are regarded as sufficient to irritate occupants and place them at risk. How many people live in these homes and who are they? Often it's caravans and mobile homes which are the resort of the elderly and the 'new poor' in our communities.

"The likelihood that large numbers of the population are exposed to unknown levels of [VOCs] justifies investigation as a matter of high priority." (Victoria's EPA.)

Radiation

Is radiation a problem? Reports from North America and the UK indicate radon is viewed as a serious concern over there. Radiation is present naturally in the air, but it disperses. However, a tightly sealed home has the ability to trap radiation.

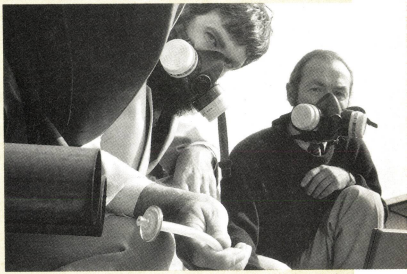
Radon is a colourless, odourless, radioactive gas which comes from uranium and other radioactive elements as they decay. It seeps through the soil and, if inhaled in sufficient doses, may cause lung cancer some time later in life. Sources of radon include brick, stone,

JUST HOW BAD IS YOUR HOME?

IF YOU WANT to find out what the air quality in your home is like it could be an expensive business. The best way is to contact a large university and see if they can handle the job — it will take a team of scientists with different skills and a whole range of equipment. You'll get a report several thousand dollars later.

Developments at the University of NSW may make this a quicker and cheaper exercise. Professor Brynn Hibbert and Associate Professor Peter Alexander of the Department of Analytical Chemistry have designed a air quality monitoring system attached to a laptop computer which, once set up for the job at hand, gives instantaneous readouts of gas concentrations in the air.

At the moment the device is useful for detecting formaldehyde, hydrogen sulphide, carbon monoxide, petrol fumes and benzene. Work is beginning on detectors for bacterial pollutants, and on reducing the device to little more than the size of a palmtop computer. If the instrument gets developed commercially, local councils and action groups will be able to keep an eye on air pollutants in their communities.



Brynn Hibbert (left) and Peter Alexander — their air quality monitoring system could make it quick and cheap to check out your home.

granite bedrock — even the phosphogypsum plasterboard on your walls and ceilings.

A nationwide survey of radon in Australian homes carried out by the Australian Radiation Laboratory (ARL) largely gives us a clean bill of health. Of 3400 homes investigated, only two had high levels of radon: ARL estimates this would equate to 2000-3000 homes across the nation.

Unlike the situation in the US and UK where radon is a problem primarily in certain defined geographical regions, here it's less easy to pinpoint. Guidelines from this study suggest radon may be more of a problem in homes with brick walls, concrete slab construction or which rely on air conditioning or wall vents alone for ventilation. And there seems to be little concern if you live near the coast.

If you are concerned you can write to the ARL for a radiation monitor. Keep the device in your home for three months then mail it back for analysis. This should cost around $30 all up.

Pesticides

Indoor concentrations of **pesticide residues** are generally low. However, the chemicals are very toxic and have a cumulative effect over time. If they are applied carelessly (such as accidental spills) or your home has annual applications of termiticides, it may become a problem, though this overkill is becoming rarer now.

What termiticides are in use? Three organochlorines (aldrin, chlordane and heptachlor) are used here. They have a residual effect for 20 years or more. Chlorpyrifos, an organophosphate, may still be there after three to 10 years.

The peak time for these chemicals entering your indoor air is the first three months after application. This is the time when the solvent migrates to the surface. When pesticide is placed around foundation stumps, for example, vapours may concentrate if ventilation is poor, and enter the living space above through cracks in floors.

Health effects include headache, nausea, dizziness, eye and skin irritation. The pesticides are being studied to see if they are carcinogenic. Some chemicals still authorised for use in Australia have been long banned in some overseas countries.

But be aware that if they do make you temporarily sick you may just be reacting to the solvents rather than the active pesticide itself. However, that may be small comfort.

Also of concern are the results of an Australian study which found the fresh application of termiticides may release *old* termiticide chemicals from previous treatments — including superseded and banned ones. This is possibly due to the volatile hydrocarbon solvent. As it evaporates from the soil it carries the new and old termiticides into the air and your home. Ventilation can help.

Finally on pesticides, take no risks with home bug bombs (pressurised containers to control insects), where a concentrated dose of chemicals is released widely in one hit. Close the doors during treatment and keep out. When you return fling the doors and windows wide open.

Heating and cooking with gas

The basic acts of cooking and heating with gas bring pollutants into the home, and here there is a very real risk to health. For example, in recent times gas heaters were modified in NSW classrooms due to widespread concern over excessive emissions of **carbon monoxide** (which can limit the body's ability to absorb oxygen). The other pollutant of concern is **nitrogen dioxide**, which can affect the lungs.

Warning signs for carbon monoxide are: drowsiness, dizziness, headaches or inability to concentrate. Nitrogen dioxide can irritate your eyes. Again, ventilation is the key. Flued heaters and rangehoods for stoves are sensible precautions, and newer gas heaters burn much cleaner than old ones.

Lead poisoning

There was a furore last year when a study of pre-school children in Sydney's inner west found that nearly 20% had a blood lead content sufficient to cause concern. **Lead poisoning** may result in retarded mental development and behavioural problems in children. At later ages it may contribute to high blood pressure, kidney disease and anaemia.

And the cause of these high levels? The researchers, in a paper in the *Medical Journal of Australia*, place the blame on home renovation (sanding and blowtorching old lead paint or lead paint scrapings in garden soil), leaded petrol and industrial pollution. They said, "The strong correlations between blood lead levels and lead levels in backyard soil and

PREVENTION: WHAT CAN YOU DO TO IMPROVE AIR QUALITY AT HOME?

HERE ARE THINGS you can do to make your home a healthier place — not just for you but for your visitors and guests too. By and large the health risks do not appear to be great, unless you have an allergy or sensitivity. Don't get paranoid!

- Get rid of condensation and moisture in the home:
  - — Install exhaust fans in bathroom and laundry.
  - — Put a rangehood over the stove, vented to outside (not back into the kitchen); keep its filter clean.
  - — Ensure your shower recess and bathroom floor drain waste water so there is no pooling.
  - — Fix leaking plumbing and guttering.
  - — Help prevent condensation forming in bedrooms and living areas by using more than a single heating source over winter.
- Increase ventilation and allow natural light inside:
  - — Leave windows open (and dress more warmly indoors during colder weather).
  - — Think about additional or larger windows (particularly on the northern wall), or a skylight, to catch the sunlight and bring its heat indoors to combat mould and damp.
- Keep dogs, cats and other furry pets outside if your children have asthma or allergies.
- Keep dust mites under control. Consider these:
  - — Wooden floors instead of carpets and blinds instead of curtains (and wash them regularly).

dust from vacuum cleaners suggest that the ingestion of dirt and dust in the home environment is an important source of lead ... The finding of a strong association between blood lead levels and the child being present during [home] renovation is consistent with previous research ... However, the elimination of lead from petrol may make an even greater contribution to reducing children's blood lead levels."

In some situations things have improved over recent years, with the introduction of lead-free petrol, the end of lead in paint (by the 1970s) and improvements in industry pollution. However, you shouldn't ignore the risks if you live near a busy road, near an industrial area or in a home with old paintwork. Again, lead is a cumulative poison.

As an aside, US courts have begun awarding personal injury damages to children poisoned by living in rented premises with peeling lead paint.

Passive smoking

There's one point on which the experts seem to agree: passive smoking is the greatest single pollution danger in the home, dwarfing all other causes of concern.

Tobacco smoke contains around 4000 compounds, of which 50 are known or suspected carcinogens. Partners of smokers have been estimated to have a 25% increased risk of lung cancer compared with those who do not smoke or are not exposed environmentally. Perhaps cigarette packs should carry a new series of warning notices, such as: "May give cancer to your family and friends".

Allergies

Your home may aggravate an allergy but, perhaps more importantly, can contribute to the development of allergies in your children. They won't inherit your allergy as such, but what they get from an allergic parent are genes which can lead this way should the child come in contact with a particular allergen in large doses.

Many allergens are in foods, but the home environment has other surprises: **dust mites** (both alive and dead), **pet dander** (a protein-like substance shed from the coats of cats and dogs), **pollens**, moulds and a host of others. See *Prevention*, above for tips on ridding your house of this kind of potential problem.

Wherever water is allowed to settle you can expect trouble with a sensitivity to **moulds and fungi**. There are the obvious problems: shower recesses which don't drain, poor ventilation in bathrooms, laundries and kitchens, leaking guttering — but having a single room heating source in winter (which leaves half the home cold) will also promote condensation. A recent survey of 12 000 homes in Sydney conducted by Archicentre, the housing division of the Royal Australian Institute of Architects, found damp in 40% of them.

Do you know if you have an allergy? Common symptoms include headaches, migraine, rashes, sore and itchy eyes, runny nose, repeated tonsilitis or ear infections — even bad breath, dizziness and nausea. Speak to your doctor or natural therapist about doing some detective work if you're concerned, and see our article *The enemy within* in the November 1992 issue of CHOICE for more information on allergies and sensitivities in general.

Biological warfare

There are many bacteria around the home — that's one reason we keep food in the fridge. But the one that strikes fear (and gets into the press) is the **legionella bacterium**.

Legionella, too, is at home — you can't stop it. But it needs nutrients, the right temperature to breed, to be turned into a fine spray, and then to find a susceptible individual. A chlorinated water supply helps keep it down, as does setting your hot water system at around 60°C to kill bacteria. Commercial air conditioning cooling towers are seen as the main problem and are where it's likely to reach danger levels — not reverse-cycle air conditioning or evaporative coolers at home.

In short, it's possible to get Legionnaire's Disease at home, but you have to be unlucky — as shown by a few recent cases where bags of potting mix were suspected of being the villain. In many ordinary cases people breathe in the bug and simply form antibodies.

— No open shelves (bookcases, etc) to gather dust.
— Get a good vacuum cleaner.
— You can buy special allergy-proof covers for pillows and mattresses, and anti-mite spray for floors (for example Allersearch).
— Keep bedrooms free of clutter (books, piles of clothes, soft toys).
— Change bedding frequently and air in sunlight.

■ Minimise or stop smoking indoors.

■ Keep paints, cleaning compounds and chemicals outside living areas and in well-sealed containers. If cleaning products make you sick, try white vinegar, bicarbonate of soda or pure soap.

■ If solvents from new furniture or paint annoy you, keep furniture or freshly lacquered items outside or in the garage for a few weeks if possible, until most of the solvent has gone. Seal all bare chipboard with paint or polyurethane.

■ Minimise or avoid altogether the use of household pesticides, especially residual pesticides like mothballs, surface sprays or pest traps using dichlorvos (check ingredients label).

■ If you want to burn wood for heating you'll get less irritation from a fully sealed heating unit vented to the outside. If you must have an open fire make sure it draws effectively; maintain chimneys and flues.

■ Flued gas heaters (with external venting) should pose no problems. If you want an unflued gas heater for its portability or cheaper price, think about buying a new one as their burners are much more efficient now — see the report in CHOICE, April 1992 (but never use one in a bedroom). Note that gas heaters and stoves burn cleaner with a blue flame, not yellow/orange. Kerosene heaters are best avoided.

■ Keep air conditioning or central heating in peak condition with expert maintenance. Are your filters still effective? They're a potential source of allergens and disease.

■ Air freshly dry-cleaned clothes before putting them away.

■ Clean up your food scraps quickly. If you don't attract insects and pests you'll have little need for chemicals to control them.

■ When buying or renting a home choose carefully:
— Away from a watercourse or swamp.
— Away from major roads with heavy traffic.
— There should be good site drainage (though drains can be installed later).
— There should be plenty of natural light and direct sun.
— Look for good subfloor ventilation (this can be improved, except for slab construction).
— Avoid garages under living areas with wooden floors, as chemical and petrol fumes come up.
— Rising damp should be treated.
— Try not to live near industrial areas.

■ Consider moving out for a few days if:
— New carpets are laid.
— Termite treatment is carried out.

Multiple chemical sensitivity

It's estimated there are more than 5000 compounds in indoor air, from perfume to cigarette smoke, liquid paper, building materials, cleaning compounds, paint, furnishings, etc. Individually the solvents and substances on which we rely for 20th Century living may be well below threshold limits. Collectively, however, they might reach a total load which is too high for certain souls to handle.

This is called **multiple chemical sensitivity**. It's an acquired disorder affecting many of the body's organs and systems in response to many chemically unrelated compounds at doses far below those established to cause harm in the general population.

Little is known about this condition and the boundaries of its domain are still being drawn. Research will be the key, but at present most of our research still considers each chemical acting on its own — not how they act together. Yet as has been found with tobacco smoke, one substance may *speed up* the health risk caused by another (such as alcohol). And not much is known about the risks in the Australian context.

Energy efficiency versus ventilation

Double glazing, weatherstripping, sealing — these things are promoted to help us conserve energy, reduce power bills and save the environment from the blight of further power stations and increased emissions of greenhouse gases. But this policy runs counter to a health policy of increasing home ventilation.

Currently Australian homes average one air change per hour (this is a measure of the degree of ventilation). But homes built in the last five years have only half this. An extra air change per hour will increase home heating costs by one-third, according to Victoria's energy authority.

Is there a winner? Not yet. It's an argument creating indigestion throughout government authorities. The answer may involve wearing an extra jumper and opening the window rather than turning up the heating. Alternatively you can make your house more energy-efficient, with windows shut at night but open during the day, or by installing 'heat recovery' ventilators.

Just how paranoid should I get?

Don't panic! For a start, it's unlikely you'll drop dead tomorrow thanks to a burden of indoor air pollution. Though 'levels of concern' for chemicals in the home are still being set in many cases, problems do occur and occupants of some individual homes may be at risk. But at present it's still unclear as to how worried we should *all* be — in the long term.

When will we have the answers? Money for research is one problem, but poor communication and co-ordination between a multiplicity of government agencies is also to blame (a conclusion reached by consultants to the Commissioner for the Environment in Victoria).

Perhaps this article will stimulate you to look at your family's health, to look for the warning signs and to be aware of the substances around you. In particular, if you or a family member has a respiratory problem, don't overlook the possibility of chemical sensitivities. You may want to follow some of the suggestions in *Prevention: what can you do to improve air quality at home?* above. But the central message is simple: ventilation helps clear the air. ❑

CONTACTS FOR HELP AND INFORMATION

■ For information on legionella bacteria contact your local health department.

■ For general information contact the Total Environment Centre, (02) 247 4714; or Householders for Safe Pesticide Use, (09) 325 6158.

There are a number of support groups. To find a local group contact:

■ Consumers' Health Forum, Canberra: (06) 281 0811.

■ Allergy Association of Australia, PO Box 74, Sylvania Heights 2224, (02) 522 7763; or Allergies and Intolerant Reactions Association, PO Box 1780, Canberra City 2601, (06) 248 6495.

TEST REPORT

KETTLE BARBECUES

Versatility's the big attraction — but read the instructions carefully or you may be disappointed.

KETTLE BARBECUES are selling at the rate of about 75 000 a year. These odd-looking cookers can char-grill steak, roast a turkey, smoke fish, bake potatoes and cook cakes.

They may all look the same, but we found some are more stable than others, some are easier to clean, and some are easier to use. And then there's the price — the ones we bought ranged from $130 to $329!

With much trial and error our testers found by the end of the project they could cook food to their satisfaction regardless of the method or the model. This is where detailed operating instructions are important — but they were only supplied with two brands: both WEBER models and the MECO.

Kettle barbecues offer two methods of cooking: over the coals in the traditional method (with or without the lid), and indirect cooking, where the coals are loaded (or gas is turned on) only round the sides of the food and the lid kept on so the heat circulates around the food. It's like cooking in a slow fan-forced oven, but with the sought-after flavour of barbecued food.

We checked six models (one gas, five solid-fuel models), each capable of catering for 10-15 people. Charcoal briquettes are the best fuel for cooking on

PROFILES

Barbecues are listed in rank order. Prices given are indicative of the range found in nationwide checks in November 1992.

WEBER ONE-TOUCH

Fuel: Solid
Price: $189/$245
Overall impression: Excellent performer; you're paying a little more for the ease of cleaning away the ash.
Good points
- Both **WEBER** barbecues had a more even temperature across the grill than the other brands, although some spots were hotter than others.
- Well-designed wooden handles reduce the risk of a burn when lifting the lid.
- *Instructions:* Excellent keyed instructions with cutaway photographs, and very clear assembly instructions in three languages. Troubleshooting guide and recipe book.

WEBER BAR-B-KETTLE

Fuel: Solid
Price: $175/$249
Overall impression: Excellent value for money.
Good points
- More even temperature across the grill than the other brands.
- Well-designed wooden handles reduce the risk of a burn when lifting the lid.
- *Instructions:* Excellent keyed instructions with cutaway photographs, and very clear assembly instructions in three languages. Troubleshooting guide and recipe book.

solid-fuel barbecues — wood isn't recommended because kettle barbecue cooking is generally done with the lid on, and even with the vents open there is not enough oxygen to allow the wood to burn. It merely smokes.

Getting it together

While kettle barbecues *look* similar in the shop, their differences become frustratingly obvious with use.

The 'Guaranteed to Confound' award went to the **MAXIE 904-021** for its devilishly inadequate assembly instructions. Some parts were wrongly identified, so figuring out the assembly instructions became more of a craft than a technical exercise; and the legs did not 'click in' as claimed — trying the good nature of the tester, who had to repeatedly remove and refix them until they did. To top it off, one part was actually missing. Two phone calls later, a return visit to the store, and we finally got the thing together.

As (by now) experienced kettle barbecue operators we cannot stress enough the importance of good cooking/operating instructions. The clear winners in this regard were the **WEBERs**, which as well as providing detailed instructions also included a recipe book and a troubleshooting guide. At the other end of the scale the **MAXIEs** provided no operating instructions — you would have needed to buy a recipe book for kettle barbecue cooking from another source — and the instructions for the **MECO Swinger** were actually wrong. Under normal conditions you might have wasted a whole season before figuring out the correct number of charcoal briquettes for a satisfactory result.

Gas vs solid fuel

Using a solid-fuel barbecue means regularly buying fuel, handling messy black charcoal briquettes and smelly firelighters, and waiting about 45 minutes for the coals to ash over before you can cook. To begin cooking before the firelighters have finished burning or the briquettes are ready is risking a kerosene taste in your food, or too fierce a heat — great if you like steaks charred on the outside and uncooked in the middle, but impossible for careful cooking.

Solid fuel also leaves an ash which needs to be cleaned out periodically from the bottom of the bowl (though the **WEBER One-Touch** provides an easy mechanism for doing this).

On the other hand, gas provides immediate heat (five minutes to reach cooking temperature), leaves no residue, and

Meco Swinger 44050

Fuel: Solid
Price: $235/$240
Overall impression: Elegant user-friendly design, marred by wrong instructions. Despite its claims, no more economical in fuel than the others.

(We also tested the claim that a well-done and a rare steak can be cooked simultaneously by tilting the cooking grill using the special device provided, and were not over-impressed. In theory this tilting device should work — the steaks furthest away from the coals are likely to cook more slowly. However, of the two rows of steaks we cooked, only one row cooked according to expectations — the others were mostly well-done too. We think that as with all barbecues, even heat distribution will have more to do with how you spread the coals underneath.)

Good points

■ Has two side-tables — none of the others has any.

■ Of all models tested the lid on this was the easiest and most convenient to handle since it was hinged to the barbecue and could be lifted up with a minimum of effort. It was also the most stable.

■ Wooden handles were designed for easy handling and were placed well away from the hot parts of the lid.

■ Wooden footboard between the legs gives a larger and safer area than the others for keeping cooking materials.

Bad points

■ *Instructions:* Clear, and recipes included. However, the operating instructions in respect of the number of briquettes were found to be misleading. The suggested number (30) produced an unsatisfactory cooking temperature and it took three to four cooking sessions to discover why the cooking speed and quality were very unsatisfactory. Ultimately, we found we needed to use more than twice the number of briquettes recommended to produce a good cooking performance.

Downunder

Fuel: Gas
Price: $295/$329
Overall impression: Good for the quick-fix enthusiasts. The costliest to buy but the cheapest to run, and the easiest to start up and shut down.

Good points

■ Cooked slightly faster than the others.

Bad points

■ Hot and cooler spots on the grill means having to shift food around to avoid charring some foods and undercooking others. The placement of the burners on the grid concentrates the heat from flames in the centre, and is probably to blame.

■ The dripping fat from the direct cooking method tended to ignite because of the gas flames underneath. However, the flares did not extend beyond the cooking grill, so it wasn't considered a safety hazard.

■ The lid of this barbecue weighed almost twice as much as lids on the other models. As the lid is lifted on and off several times during cooking, the extra weight is a disadvantage.

■ Flimsy plastic handles screwed on, not welded; only just away from the hot parts.

■ The grill on this barbecue was about 9 cm higher than the others — not a problem for anyone standing, but if the chef was cooking from a wheelchair this height could be inconvenient, especially if the height of the chair wasn't adjustable.

■ *Instructions:* Assembly instructions were barely adequate, with few illustrations. Operating instructions were only fair.

Maxie 904-049

Fuel: Solid
Price: $179/$199
Overall impression: An 'okay' performer, with no outstandingly good points.

Bad points

■ Flimsy plastic handles too close to the hot rims (200–250°C) of the bowl and the lid.

■ *Instructions:* No operating instructions were provided, no safety precautions, no troubleshooting guide, and no recipes.

Maxie 904-021

Fuel: Solid
Price: $119/$139
Overall impression: Questionable durability; the cheapest of those we tested. No outstandingly good points.

Bad points

■ The lightest of all the models (indicating it was made of a thinner steel plate material), and the baked enamel finish on the outside became badly burnt and discoloured after only two cooking sessions.

■ Took the longest of any to assemble (95 minutes) due to wrongly identified parts and because the legs would not click in as they were supposed to. Additionally, one of the vent plates with its fixing screws was missing from the package.

■ Flimsy plastic handles too close to the hot rims (200–250°C) of the bowl and the lid.

■ *Instructions:* No operating instructions provided, no safety precautions, no troubleshooting guide, and no recipes.

is cheaper to operate — about a third the cost of solid fuel.

The gas barbecue also cooled down the fastest. Barbecues which use solid fuel depend on the effectiveness of the vent closures — one barbecue (the **MAXIE 904-049**) took more than five hours to cool.

But a gas unit costs more to buy, there's an additional cost for the gas bottle itself (around $77 for 9 kg capacity), and is heavier and more awkward to move. The gas model we tested (**DOWNUNDER**) was very unstable on a 15° slope, and required a lot of effort to move it even over the shortest distance. The distributor says you can use 4.5 kg cylinder, which might make the barbecue more stable (we didn't test this), but the instructions imply you should use a 9 kg cylinder.

The big cook-off

Contrary to tradition, barbecue cooking in kettle barbecues is recommended to be done *with the lid on*. This applies even to steak and seafood which take only minutes to cook. The juices are claimed to be better retained in the closed method of cooking.

The problem is, you can't see what's happening to the food. Our testers charred a number of steaks and a chicken before realising the instructions were far from perfect and they would have to improvise. Even with good instructions you will have to take time out to really learn about your barbecue: how moving the coals around will create different cooking temperatures across the grill, how the number of briquettes affects the cooking times, and which method (direct or indirect) achieves the result you want.

We found uneven heat distribution across the grills of all the barbecues tested — the **WEBER**s had less of a problem, the **DOWNUNDER** was the worst. That is, the steaks in the centre cooked faster than those on the outside. This could be seen as an advantage if you want to cook foods of different densities at the same time, or get different levels of 'doneness', but is a disadvantage if you want all your food cooked evenly.

Our testers did some experimenting and suggest that if uneven cooking is a problem with your barbecue you should distribute briquettes more thickly around the edges. We tried this on two of the barbecues and the steaks cooked more evenly.

We also assessed the cooking performance for each barbecue using the indirect method. We found the time taken to cook foods properly varied considerably, and often didn't relate very closely to times given in cookbooks. You'll need to experiment.

The **DOWNUNDER** (gas) barbecue charred the chicken on the end closest to the flames. It's likely this charring could be avoided by rotating the chicken throughout the cooking time.

What do you get for your money?

If all the barbecues can ultimately produce satisfactory cooking results with good operating instructions (or even trial and error) but one is more expensive than another, what do you get for your money?

The gas barbecue was the most expensive, and will give you almost immediate heat. It's also faster at cooling down — a big plus if you want to store the unit away. In contrast, one of the cheaper barbecues (the **MAXIE 904-049** solid-fuel model) took ages to cool. Even after five hours it was still burning, and couldn't be stored indoors.

The **MECO Swinger 44050** at around $200 gives you side-table space, and storage space underneath it. The **WEBER One-Touch** (also around $200) enables you to clear away the ash easily.

Apart from these obvious features there are small design differences between models which can make for a happy or hassled barbecuing experience — see the profiles for details.

KETTLE BARBECUES

1

Brand/model (in rank order)	Manufacturer distributor
WEBER One-Touch	R McDonald
WEBER Bar-B-Kettle	R McDonald
MECO Swinger 44050	Galore Group
DOWNUNDER	Galore Group
MAXIE 904-049	Maxco Industrie
MAXIE 904-021	Maxco Industrie

What to buy

Brand/model (in rank order)	Price ($)*
WEBER One-Touch (solid-fuel)	189/245
WEBER Bar-B-Kettle (solid-fuel)	175/249
MECO Swinger 44050 (solid-fuel)	235/240
DOWNUNDER (gas)	295/329

* Prices given are indicative of the range found in nationwide checks in November 1992.

IT'S HOT!!

THE OUTSIDE of these barbecues gets extremely hot. In some cases the outside temperature of the ones we tested reached 250°C, so check:

- What are the handles made of? Wooden handles tend to be more comfortable than plastic.
- Are the handles sufficiently high off the lid so you don't burn your knuckles when you pick it up? Some of the barbecues we tested did not allow sufficient clearance for this.
- Are the handles bolted on, or welded to the barbecue? Nuts and bolts will work loose over time; a welded handle should remain in place for the life of the barbecue.

Kettle barbecues have featured in a number of accidents where the burns were severe enough to warrant the victim being taken an accident and emergency department.

National injury data reveal it's children who are most at risk:

- "Ran into kettle barbecue."
- "Walking in dad's shoes. Stumbled and fell against hot barbecue."
- "Playing and fell onto a barbecue lid placed on the ground."

With the lid on there is no visual indication of the heat generated by the almost white-hot coals. Keep small children well away. (The **DOWNUNDER** barbecue has a small thermometer on the outside of the lid, but a child is unlikely to read this before running into the barbecue.)

An additional word of caution. Injury statistics show adults can get burnt too, but an alarming proportion of those statistics reveal burns caused by gas explosions:

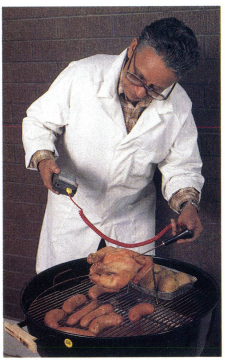
- "Lighting BBQ, lit gas which flared up — lit carelessly, not a product failure."
- "Lighting gas barbecue, burst of flame thrown against face."
- "Relighting flame and BBQ exploded in face."
- "Lighting a gas BBQ, blew up in face, burns to face, chest and arms."

It's important when lighting any gas appliance to light the match first, then turn on the gas. Don't turn on the gas and then start looking for a lighter. By the time you've struck a light you're probably standing next to a pool of gas, which is going to explode.

rigin	Warranty (years)	Price ($)*	Type of fuel	Handles	2 Stability (without lid/ with lid)	3 Cooking performance score (%)	4 Ease of use score (%)	5 Overall score (%)
JSA	5 *(A)*	189/245	Solid	Wood	Pass / Fail	94	74	86
JSA	5 *(A)*	175/249	Solid	Wood	Pass / Fail	94	69	84
JSA	not stated	235/240	Solid	Wood	Pass / Pass	69	80	74
iiwan	not stated	295/329	Gas	Plastic	Fail / Fail	78	57	70
iiwan	not stated	179/199	Solid	Plastic	Fail / Fail	67	40	56
iiwan	not stated	119/139	Solid	Plastic	Pass / Fail	67	40	56

* Prices shown are indicative of the range found in nationwide checks in November 1992; they don't include the gas bottle for the Downunder model. *(A)* Excluding grills (1 year).

The Downunder (pictured) and the Maxie 904-049 started to tip on a 15° slope even without their lids — make sure you use them on level ground. The Downunder's distributor says using a smaller gas bottle may make the barbecue more stable, but the instructions don't say this.



When cooking chicken, sausages and potatoes with the lid on, we found the time taken to cook the foods properly varied considerably — you'll need to experiment.

1 COMPARABLE MODELS AND CONVERSION KITS

WEBER and **DOWNUNDER** both have other models in their ranges with extra features such as side-tables, lid-holders and thermometers. You can also buy a **MECO** without side-tables. While their cooking performance is likely to be the same as that of the models tested, these features will naturally affect their ease of use.

Gas conversion kits are available for some solid-fuel kettle barbecues (around $100). However, we have not tested these. If you are considering buying one, check for Australian Gas Association approval and whether use of a conversion kit will affect the warranty on your barbecue.

2 STABILITY

We tested each model for stability on a 15° slope. When the barbecues were tested without the lid, two models (the **MAXIE 904-049** and the **DOWNUNDER**) failed. However, because the manufacturers recommend keeping the lid on during cooking, we also tested each model with the lid on. All failed except the **MECO Swinger**, underlining the necessity of ensuring they are used on level, stable ground.

3 COOKING PERFORMANCE

We barbecued steak over the coals (or gas, in one case), and cooked chicken, sausages (high fat), and potatoes (high starch) using the indirect method (coals placed to the sides or gas only turned on on one side). We rated each barbecue on the result of the cooked product, how the operating instructions ultimately affected the results, uniformity of cooking, speed of cooking, and the quality of the instructions about safety while cooking.

4 EASE OF USE

Each barbecue was rated on how easy it was to assemble and disassemble, for stability, manoeuvrability, how easy it was to start up and close down, whether the handles got hot and ease of cleaning.

5 OVERALL SCORE

The overall score comprised 60% cooking performance, and 40% ease of use.

BEST FAMILY WASHING MACHINES

Choose your next washing machine from this comprehensive test of 84 models.

TO HELP YOU find the best model we've brought together test information on virtually all medium to large (4-7 kg load) automatic washing machines available.

In general the front loaders perform best, particularly for spin efficiency and gentleness to clothes, but most are relatively expensive to buy and install, and their cycle times are long compared with top loaders. And once the water level rises above the bottom of the door it's impractical to add forgotten clothes.

Top loaders are cheaper and wash just as well but use more water and electricity; most do more damage to your clothes, too. Some cheaper front loaders suffer from poor soil removal scores, but are bolstered by good results for efficiency and gentleness.

IN THE WASH

We tested the machines for how well they washed (soil removal), spin efficiency, water and energy efficiency, and gentleness. Details are given opposite, and scores in the tables on pages 42-45. Most gave acceptable soil removal results, but there were big differences in spin efficiency (how dry the clothes end up), water/energy consumption and gentleness.

Some machines had problems:

■ **Over-ambitious load claims:** We all want to get the job done quickly, but some manufacturers claim a greater load than the machine can properly handle: this was particularly the case for the ADMIRAL 1410, NORGE A1408 and KLEENMAID KAW651, which could only take 5 kg, not the claimed 7 kg. This is not fair to the consumer.

■ **Dirt transfer:** Clothes washed in the BOSCH WMV4280 were marked with discolouration from coming in contact with the rubber door seal. This improved after a couple of wash cycles, but we are not convinced it won't recur. The seal should be changed and we have notified the distributor about the problem. Bosch says it is due to copper in the water supply, but other machines are not affected.

There are also a few good features which may suit your needs:

■ **Automatic load adjustment:** If the load becomes unbalanced during spinning does your machine stumble along the laundry floor like a dying Dalek, or just drop its bundle and stop? Some take affirmative action: the AEG Öko Lavamat Sensortronic 645 and the HITACHI SAF 2000PX readjust the load, either by adding more water to refloat the clothes or by reversing the spin, and carry on. The HOOVER Electra 540 and 545 and BENDIX L105RX distribute the load before starting to spin; the MIELEs will spin at a lower speed or not spin at all.

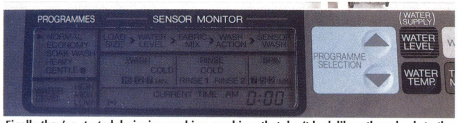
■ **Delayed start timer:** This is a feature on the GORENJE PACIFIC PS835, MIELE W733 and W736 Megatronics, SHARP ES-M55AP and SIMPSON Concorde 711. Looking at the task a different way, the HITACHI SAF 2000PX can be programmed to *finish* at a set time (so, for example, you can put the clothes on the line before leaving for work).

■ **Fuzzy logic:** The HITACHI SAF 2000PX has fuzzy logic — which, in this context, means the machine automatically sets the wash program after using special sensors to analyse the load. It will automatically set the wash time, temperature, water level, spin time and wash action. We found the machine works well with fuzzy logic or without it (that is, set manually) — you'll be paying extra for convenience, not results. Overall it's one of the best top loaders, but it uses a vast amount of water (184 litres for a normal wash, compared with the ASKO ASEA 12003's 77 litres).

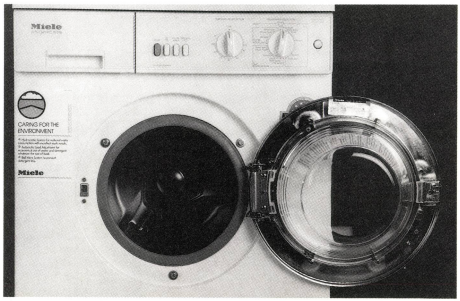
■ **Open door:** The door on the front-loading MIELEs opens right out of the way, folding back against the machine (see photo below). This makes it much easier to get clothes in and out.

GREENEST MACHINES

Energy efficiency and water conservation are important factors when considering the environmental friendliness of washing machines. Columns 5 and 6 of the table give you the comparison be-



Finally they've started designing washing machines that don't look like a throwback to the 1940s. The Hitachi SAF 2000PX's liquid crystal display is an example.



The Mieles' door folds back against the machine, making it easier to get clothes in and out.

tween machines. If you're looking for the 'greenest' machine based on these factors we'd suggest any of the five MIELEs, the AEG or the two THORs.

Cycle time

Do you have a lot of washing to get done? If so, pay particular attention to the cycle times in the table. A normal warm wash (without pre-wash) could be heading for the line in as little as 30 minutes, or as long as *four times* this — a remarkable two hours in some of the European front loaders. Part of this long period may be due in certain cases to internal water heating (which may not be necessary in all cases), but it is still a long time.

On the plus side, however, if you choose a model with good spin efficiency (see table), your clothes should emerge much dryer, so to a degree you can compensate for a long cycle by saving time in the sun or clothes dryer.

Conclusions

There's no dispute that in general top loaders wash as clean as front loaders. But, once you look at other criteria of performance, the expensive front loaders remain the best machines overall — if you can afford them. If not, the list below picks the Best Buys.

Don't forget to check with the table for the dimensions of the washing machine (to fit your space), the tap connections required, and decide whether you need a heater.

Best buys

If you can afford the best, buy from the top of the table overleaf after deciding whether you want a front or top loader. Our 'Best Buys' below take into account value for money as well as performance.

Brand/model (in rank order)	Price ($)*
FRONT LOADERS	
Expensive:	
BENDIX L43RX (with heater)	1040/1095
Budget:	
HOOVER Electra 540	756/856
HOOVER Electra 545 (with heater)	829/879
TOP LOADERS	
HITACHI PAF 1220P	699/802
HITACHI PAF 1260PX	760/889

These were the two top-scoring top loaders as well as being reasonable value for money; if you can't find them in your area, check out the **SIMPSONs** and **HOOVERs** just below them in the table. If you want a top loader with a heater, you have only one option:

HOOVER Elite 1225 (with heater)	1019/1100

*Prices are indicative of the range found in nationwide checks in September and November 1992. Price includes installation for the Bendix and Hoover front loaders.

These notes relate to the numbered columns in the table starting overleaf.

1 Clones

Some machines are identical in performance though sold or badged under a variety of names and with different features, such as a heater or suds saving. Such 'clone' groups are indicated in column 1 by a square bracket to the right of the names. Different features and wash programs also account for differences in price.

2/3 Tap connections/heater

If the machine needs both hot and cold water taps we've marked it 'H&C'. If you've only got a cold tap in your laundry, choose a machine which doesn't need a hot connection: 'C' or 'C/H&C' — plus a heater if you prefer to wash in warm water.

4 Warm wool rinse

The Australian Wool Corporation recommends a warm wash with a warm rinse; we've noted machines with this cycle option.

Performance

Washing machines were tested on the normal warm wash cycle (40°C) using detergent quantities based on the Australian Standard. Though we haven't tested all the machines with a cold wash, we believe soil removal comparisons will remain the same.

We tested 13 new machines this time and have added them to performance data from previous tests where the models are still available.

5 Energy efficiency

We measured energy efficiency on the basis of kilowatt hours of electricity used for each kilogram of a load of washing, including heating the water (whether by the machine's own heater or by your household hot water system).

6 Water efficiency

Water efficiency was calculated by relating the amount of water the machine used per kilogram of wash load to a 'worst case' of 50 litres per kilogram (50 L/kg would score zero).

7 Gentleness

Swatches of easily frayed embroidery fabric, as specified in the Australian Standard, were attached to garments in each wash load. After three wash cycles the unfrayed area of the swatch was measured and compared to the original size of the swatch. Machines were rated as more gentle according to the percentage of unfrayed material. Some newer designs of top loaders show improved performance in this test: look for a score of 70% or more.

8 Spin efficiency

Spin efficiency was calculated from the amount of water remaining in the clothes after the wash cycle was complete.

9 Soil removal

Soil removal was tested by comparing the amount of light reflected by test swatches of fabric before and after washing. The Standard requires the percentage of soil removal should not be less than 80% when tested on a normal warm wash; some machines didn't perform up to the Standard.

10 Overall score

The overall score comes from combining scores for energy efficiency, water efficiency, gentleness, spin efficiency and soil removal; each factor was weighted equally.

For people with disabilities

The washing machines were assessed by representatives from the Independent Living Centre.

In general, front loaders are more convenient for people in wheelchairs or for those who find it difficult to reach down into a top-loading tub and pull out the load. The **MIELE** machines have a door which folds right out of the way (back against the machine), which is a good idea. In contrast the **ASKO ASEA 12003** has an outer fold-down door which will make it difficult to get close.

Good controls and easy door levers are on three other front loaders: **BOSCH WFM 3010** and the **HOOVER Electra 540** and **545**.

Other potential problems with front loaders were: small and unclear markings on the two **BENDIX** machines, difficult door operation on the **BOSCH WMV4280**, and controls on the **AEG Öko Lavamat Sensortronic 645** which might be hard to grip for a person with arthritis.

Of the top loaders the **HITACHI PAF 1260PX** and **SAF 2000PX, PANASONIC NA P865AN, SIMPSON Concorde 711** and **SHARP ES-M55AP** had pushbutton controls which were easy to operate.

Lids were lower to the ground on the **PANASONIC NA P865AN** and **SHARP ES-M55AP**.

WASHING MACHINES

	1 Brand and model (in rank order)	Manufacturer/ distributor	Origin	Price ($)*	1 Warranty (years)	1 Cycle time (minutes)**	1 Dimensions HxW/D (mm)***	1 Wash load (claim/tested)	2 Tap connection†	3 Heater	4 Warm wool rinse
equal	**MIELE** W723 Hydromatic **(F)**	Miele	Germany	2699	1	115	850x595x623	5/5	C	✓	
	MIELE W698 Hydromatic **(F)**	Miele	Germany	2399	1	115	850x595x623	5/5	C	✓	
	MIELE W736 Megatronic **(F)**	Miele	Germany	3049	1	120	850x595x615	5/5	C	✓	
	MIELE W733 Megatronic **(F)**	Miele	Germany	2899	1	120	850x595x615	5/5	C	✓	
equal	**MIELE** W711 Hydromatic **(F)**	Miele	Germany	2499	1	110	850x595x623	5/5	C	✓	
	THOR W1116RX **(F)**	Healco	Italy	1479/1599	1	60	850x595x600	6/6	C/H&C		✓
	THOR W692RX (F)	Healco	Italy	1525	1	60	850x595x600	6/6	C/H&C		✓
	AEG Öko Lavamat Sensortronic 645 **(F)**	Andi	Germany	2499	3	85	850x595x630	5/5	C/H&C	✓	
equal	**ASKO ASEA** 12003 **(F)**	Asko	Sweden	1525/1750	2 *(B)*	65	820x600x620	4.5/4.5	C/H&C	✓	
	BOSCH WFM 3010 (F)	Robert Bosch	Germany	1780/1879	1	135	845x600x600	5/5	C/H&C	✓	
equal	**BENDIX** L43RX **(F)**	Healco	Italy	1040/1095	1 *(C)*	85	850x595x573	5/5	C/H&C	✓	
	BENDIX L105RX **(F)**	Healco	Italy	1353/1425	1 *(C)*	95	850x595x573	5/5	C/H&C	✓	
	GORENJE PACIFIC PS835 **(F)**	Gorenje	Yugoslavia	870/990	1 *(B)*	50	850x600x600	5/5	C/H&C	✓	
	OMEGA CW1100/2 **(F)**	Omega	Italy	1450/1490	2	85	840x590x510	4.5/4.5	H&C	✓	
	BOSCH WMV4280 **(F)**	Robert Bosch	Spain	1278/1358	1	120	852x593x550	4.5/4.5	C/H&C	✓	
	GORENJE PACIFIC PS99 **(F)**	Gorenje	Yugoslavia	557/717	1 *(B)*	45	850x600x600	4.5/4.5	C/H&C		
equal	**HOOVER** Electra 540 **(F)** *(A)*	Hoover	Australia	756/856	1	50	855x584x563	4/4	C/H&C		✓
	HOOVER Electra 545 **(F)** *(A)*	Hoover	Australia	829/879	1	50	855x584x563	4/4	C/H&C	✓	✓
	HITACHI PAF 1220P	Hitachi	Japan	699/802	2	35	1035x610x600	5.5/5.5	H&C		
	HITACHI PAF 1260 PX	Hitachi	Japan	760/889	2	35	1020x610x610	5.5/5.5	H&C		
	HITACHI SAF 2000PX	Hitachi	Japan	1015/1249	2	60	935x610x615	7/6	C/H&C		
	SIMPSON Concorde 507	Email	Australia	620/714	1	40	1050x575x630	4.5/4.5	C/H&C		✓
equal	**SIMPSON** Deluxe 516	Email	Australia	679/749	1	40	1050x575x630	4.5/4.5	C/H&C		✓
	SIMPSON Genesis 505	Email	Australia	590/649	1	40	1050x575x630	4.5/4.5	C/H&C		✓
	SIMPSON Genesis 508	Email	Australia	749	1	40	1050x575x630	4.5/4.5	C/H&C		✓
	SIMPSON Riviera 412	Email	Australia	759	1	40	1050x575x630	4.5/4.5	C/H&C		
	WESTINGHOUSE Laundromat 550	Email	Australia	699	1	40	1050x575x630	4.5/4.5	C/H&C		
equal	**HITACHI** SAF 1020 PX	Hitachi	Japan	799/859	2	35	1010x570x570	4.5/4.5	H&C		
	WHIRLPOOL 6AWG 704 **(F)**	Whirlpool	Italy	825	2	55	850x600x540	4.5/4.5	H&C	✓	
	ADMIRAL 5100	Hoover	Australia	789/825	1	40	990x600x650	5/5	C/H&C		
	HOOVER Commodore 792	Hoover	Australia	600/710	2	40	990x600x650	5/5	C/H&C		
	HOOVER Galaxy 784	Hoover	Australia	689/699	2	40	990x600x650	5/5	C/H&C		
	HOOVER Premier 750	Hoover	Australia	611/710	2	40	990x600x650	5/5	C/H&C		
equal	**HOOVER** Premier 770	Hoover	Australia	699/749	2	40	990x600x650	5/5	C/H&C		
	HOOVER 800	Hoover	Australia	789/829	2 *(D)*	40	990x600x650	5/5	C/H&C		
	HOOVER 900	Hoover	Australia	740/876	2 *(E)*	40	990x600x650	5/5	C/H&C		
	HOOVER 972	Hoover	Australia	879/929	2 *(E)*	40	990x600x650	5/5	C/H&C		
	HOOVER 1000	Hoover	Australia	979/999	2 *(G)*	40	990x600x650	5/5	C/H&C		
	OMEGA CW505/2 **(F)**	Omega	Italy	995/1250	2	65	850x600x530	4.5/4.5	C/H&C	✓	
	ADMIRAL 6100	Hoover	Australia	879/929	1	45	1080x660x740	6/6	C/H&C		✓
	HOOVER 1500	Hoover	Australia	1005/1199	2 *(G)*	45	1080x660x690	6/6	C/H&C		✓
	HOOVER 1400	Hoover	Australia	907/1047	2 *(E)*	45	1080x660x690	6/6	C/H&C		✓
	HOOVER 1420	Hoover	Australia	999/1109	2 *(E)*	45	1080x660x690	6/6	C/H&C		✓
equal	**HOOVER** 1300	Hoover	Australia	879/929	2 *(D)*	45	1080x660x690	6/6	C/H&C		✓
	HOOVER Elite 1205	Hoover	Australia	690/799	2	45	1080x660x740	6/6	C/H&C		✓
	HOOVER Elite 1210	Hoover	Australia	764/851	2	45	1080x660x740	6/6	C/H&C		✓
	HOOVER Elite 1220	Hoover	Australia	845/895	2	45	1080x660x740	6/6	C/H&C		✓
	HOOVER Elite 1225	Hoover	Australia	1019/1100	2	50	1080x660x740	6/6	C/H&C	✓	✓

RMANCE

5 6 7 8 9 10

efficiency (%)	Water efficiency (%)	Gentleness (%)	Spin efficiency (%)	Soil removal (%)	Overall rating (%)	Brand and model (in rank order)
	68	89	81	86	82	**MIELE** W723 Hydromatic **(F)**
	67	92	74	87	82	**MIELE** W698 Hydromatic **(F)**
	68	90	78	84	81	**MIELE** W736 Megatronic **(F)**
	68	90	78	84	81	**MIELE** W733 Megatronic **(F)**
	69	89	73	85	81	**MIELE** W711 Hydromatic **(F)**
	70	85	80	85	81	**THOR** W1116RX **(F)**
	70	85	80	85	81	**THOR** W692RX **(F)**
	74	93	52	83	78	**AEG** Öko Lavamat Sensortronic 645 **(F)**
	66	89	70	84	78	**ASKO ASEA** 12003 **(F)**
	62	86	73	85	78	**BOSCH** WFM 3010 **(F)**
	62	95	63	82	77	**BENDIX** L43RX **(F)**
	61	90	68	83	77	**BENDIX** L105RX **(F)**
	52	87	65	75	74	**GORENJE PACIFIC** PS835 **(F)**
	48	81	66	86	72	**OMEGA** CW1100/2 **(F)**
	49	89	47	87	71	**BOSCH** WMV4280 **(F)**
	62	87	42	78	70	**GORENJE PACIFIC** PS99 **(F)**
	43	91	55	83	70	**HOOVER** Electra 540 **(F)** *(A)*
	43	91	55	83	70	**HOOVER** Electra 545 **(F)** *(A)*
	54	72	62	79	68	**HITACHI** PAF 1220P
	53	69	52	87	67	**HITACHI** PAF 1260 PX
	39	72	62	85	67	**HITACHI** SAF 2000PX
	43	72	69	85	67	**SIMPSON** Concorde 507
	43	72	69	85	67	**SIMPSON** Deluxe 516
	43	72	69	85	67	**SIMPSON** Genesis 505
	43	72	69	85	67	**SIMPSON** Genesis 508
	43	72	69	85	67	**SIMPSON** Riviera 412
	43	72	69	85	67	**WESTINGHOUSE** Laundromat 550
	44	68	62	82	66	**HITACHI** SAF 1020 PX
	54	88	29	70	66	**WHIRLPOOL** 6AWG 704 **(F)**
	44	62	64	88	65	**ADMIRAL** 5100
	44	62	64	88	65	**HOOVER** Commodore 792
	44	62	64	88	65	**HOOVER** Galaxy 784
	44	62	64	88	65	**HOOVER** Premier 750
	44	62	64	88	65	**HOOVER** Premier 770
	44	62	64	88	65	**HOOVER** 800
	44	62	64	88	65	**HOOVER** 900
	44	62	64	88	65	**HOOVER** 972
	44	62	64	88	65	**HOOVER** 1000
	47	87	31	75	65	**OMEGA** CW505/2 **(F)**
	46	74	41	86	64	**ADMIRAL** 6100
	46	74	41	86	64	**HOOVER** 1500
	46	74	41	86	64	**HOOVER** 1400
	46	74	41	86	64	**HOOVER** 1420
	46	74	41	86	64	**HOOVER** 1300
	46	74	41	86	64	**HOOVER** Elite 1205
	46	74	41	86	64	**HOOVER** Elite 1210
	46	74	41	86	64	**HOOVER** Elite 1220
	46	74	41	86	64	**HOOVER** Elite 1225

Table continued overleaf...

WASHING MACHINES (CONTINUED)

	1									2	3	4
	Brand and model (in rank order)	Manufacturer/ distributor	Origin	Price ($)*	Warranty (years)	Cycle time (minutes)**	Dimensions HxWxD (mm)***	Wash load (claim/measured)		Tap connection†	Heater	Warm wool rinse
	SIMPSON Contessa 405	Email	Australia	594/607	1	40	1050x575x630	4/4	C/H&C			✓
	SIMPSON Delta 402	Email	Australia	530/599	1	40	1050x575x630	4/4	C/H&C			
equal	**SIMPSON** Genesis 504	Email	Australia	566/648	1	40	1050x575x630	4/4	C/H&C			✓
	SIMPSON Riviera 406	Email	Australia	599	1	40	1050x575x630	4/4	C/H&C			
	WESTINGHOUSE Laundromat 420	Email	Australia	599	1	40	1050x575x630	4/4	C/H&C			
	WESTINGHOUSE Laundromat 725 *(L)*	Email	Australia	670/768	1	50	1080x670x710	5.5/5.5	C/H&C			✓
	HOOVER Gemini 794	Hoover	Australia	629/659	2	40	1000x600x650	4/4	C/H&C			
	HOOVER Premier 710	Hoover	Australia	565/639	2	40	1000x600x650	4/4	C/H&C			
	HOOVER 705	Hoover	Australia	513/629	1	40	1000x600x650	4/4	C/H&C			
	KLEENMAID KAW651	Kleenmaid	USA	1100/1250	2 *(H)*	40	1070x650x710	7/5	H&C			
	SIMPSON Aquarius 804	Email	Australia	799	1	45	1115x670x710	5.5/5.5	C/H&C			✓
	SIMPSON Riviera 705	Email	Australia	690/732	1	45	1115x670x710	5.5/5.5	C/H&C			✓
equal	**SIMPSON** Contessa 812	Email	Australia	1014	1	45	1115x670x710	5.5/5.5	C/H&C			✓
	SIMPSON Aquarius 806	Email	Australia	839	1	50	1115x670x710	6/6	C/H&C			✓
	SIMPSON Aquarius 808	Email	Australia	878	1	50	1115x670x710	6/6	C/H&C			✓
	SIMPSON Concorde 711	Email	Australia	899	1	50	1115x670x710	6/6	C/H&C			✓
	SIMPSON Riviera 715	Email	Australia	699	1	50	1115x670x710	6/6	C/H&C			✓
	SIMPSON Deluxe 813	Email	Australia	849	1	50	1115x670x710	6/6	C/H&C			✓
	SIMPSON Concorde 814	Email	Australia	825	1	50	1115x670x710	6/6	C/H&C			✓
	WESTINGHOUSE Laundromat 750 *(L)*	Email	Australia	895	1	50	1115x670x710	6/6	C/H&C			✓
	MAYTAG A9400	Maytag	USA	1345/1700	5	30	1120x648x680	5.5/5	C/H&C			
	MAYTAG A9800	Maytag	USA	1700/1800	5	30	1120x648x680	5.5/5	C/H&C			✓
equal	**ADMIRAL** 1410	Hoover	USA	900/1053	2 *(J)*	40	1117x690x690	7/5	H&C			✓
	NORGE A1408	Hoover	USA	1049/1069	2	40	1117x690x690	7/5	H&C			✓
	PANASONIC NA P865AN	Panasonic	Japan	749	1	40	1016x587x595	4.5/4	C/H&C			
	SHARP ES-M55AP	Sharp	Philippines	599	1	45	905x595x610	4/4	C/H&C			✓
equal	**WHIRLPOOL** 6LA5800XT	Whirlpool	USA	1075/1199	2 *(K)*	30	1090x685x650	5.5/5	H&C			
	IGNIS 6MAX5133	Whirlpool	USA	899	2 *(K)*	30	1090x685x650	5.5/5	H&C			
	WHIRLPOOL 6LA9320	Whirlpool	USA	1249	2 *(K)*	30	1090x685x650	5.5/5	H&C			
	AMERICANA AW9830	MEA	Canada	849/949	1	40	1085x685x650	5/5	H&C			
equal	**GENERAL ELECTRIC** WWA6513	MEA	Canada	799/900	1	40	1080x686x635	5/5	H&C			
	GENERAL ELECTRIC WWA9067	MEA	Canada	922/1020	1	40	1080x686x635	5/5	H&C			
	GENERAL ELECTRIC WWA9570	MEA	Canada	1149/1249	1	40	1080x686x635	5/5	H&C			
	WHIRLPOOL 6LA6300XT	Whirlpool	USA	895/1099	2 *(K)*	30	1060x610x660	4/4	H&C			
equal	**WHIRLPOOL** 6LA5400	Whirlpool	USA	850	2 *(K)*	30	1060x610x660	4/4	H&C			
	IGNIS 6MAL5143	Whirlpool	USA	849	2 *(K)*	30	1060x610x660	4/4	H&C			

F front loader; all others are top loaders.

* Where two prices are shown, they indicate the range found in nationwide checks in September and November 1992; a single price indicates a quote from an alternative source. Price includes installation for the AEG, Asko Asea, Bendix, Bosch, Hoover (front loaders), Maytag, Miele and Thor washing machines.

** 'Normal' cycle rounded to nearest five minutes; the cycle time of machines with heaters will vary slightly depending on the temperature of the intake water.

*** Dimensions may vary from those shown due to plumbing requirements. If space is limited make sure you have allowed for plumbing.

† **H&C** — must be connected to hot and cold water. **C/H & C** — may be connected to hot and cold water or cold only. **C** — cold water connection only.

†† Total water used on normal cycle (litres).

(A) The Hoover 540 and 545 replace the 530 and 535 respectively. Hoover says small changes have been made but the differences are cosmetic only.

(B) Plus eight years on drum and inner door lining.

(C) Plus five years on motor (parts only) and 10 years on stainless steel cylinder (parts onl

(D) Two years parts and labour, five years on top and lid.

(E) Two years parts and labour, five years (parts only) on top, lid, cabinet and transmissior assembly.

(G) Plus five, 10 and 20 years (parts only) for various parts of the transmission, cabinet and wash bowl.

(H) Plus three years cabinet rust from inside out, plus eight years transmission, plus 18 years stainless steel tub.

(J) Plus eight years' conditional warranty on some parts.

(K) Plus five years gearcase and rust, 10 years on outer tub.

(L) Email tells us this model will be superseded soon.

ORMANCE

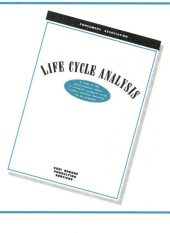
5	6	7	8	9	10

y efficiency (%)	Water efficiency (%)	Gentleness (%)	Spin efficiency (%)	Soil removal (%)	Overall rating (%)	Brand and model (in rank order)
	39	71	63	85	64	**SIMPSON** Contessa 405
	39	71	63	85	64	**SIMPSON** Delta 402
	39	71	63	85	64	**SIMPSON** Genesis 504
	39	71	63	85	64	**SIMPSON** Riviera 406
	39	71	63	85	64	**WESTINGHOUSE** Laundromat 420
	41	65	63	87	63	**WESTINGHOUSE** Laundromat 725 *(L)*
	33	64	64	89	62	**HOOVER** Gemini 794
	33	64	64	89	62	**HOOVER** Premier 710
	33	64	64	89	62	**HOOVER** 705
	42	72	47	84	62	**KLEENMAID** KAW651
	42	65	58	87	62	**SIMPSON** Aquarius 804
	42	65	58	87	62	**SIMPSON** Riviera 705
	42	65	58	87	62	**SIMPSON** Contessa 812
	41	59	63	87	62	**SIMPSON** Aquarius 806
	41	59	63	87	62	**SIMPSON** Aquarius 808
	41	59	63	87	62	**SIMPSON** Concorde 711
	41	59	63	87	62	**SIMPSON** Riviera 715
	41	59	63	87	62	**SIMPSON** Deluxe 813
	41	59	63	87	62	**SIMPSON** Concorde 814
	41	59	63	87	62	**WESTINGHOUSE** Laundromat 750 *(L)*
	36	79	47	82	61	**MAYTAG** A9400
	36	79	47	82	61	**MAYTAG** A9800
	32	81	59	76	61	**ADMIRAL** 1410
	32	81	59	76	61	**NORGE** A1408
	31	65	60	83	61	**PANASONIC** NA P865AN
	22	65	66	84	60	**SHARP** ES-M55AP
	35	77	49	79	60	**WHIRLPOOL** 6LA5800XT
	35	77	49	79	60	**IGNIS** 6MAX5133
	35	77	49	79	60	**WHIRLPOOL** 6LA9320
	27	72	55	83	59	**AMERICANA** AW9830
	32	75	42	84	59	**GENERAL ELECTRIC** WWA6513
	32	75	42	84	59	**GENERAL ELECTRIC** WWA9067
	32	75	42	84	59	**GENERAL ELECTRIC** WWA9570
	35	74	40	79	57	**WHIRLPOOL** 6LA6300XT
	35	74	40	79	57	**WHIRLPOOL** 6LA5400
	35	74	40	79	57	**IGNIS** 6MAL5143

CRADLE TO GRAVE

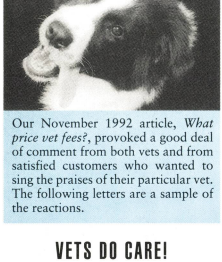
CAN WE FIND OUT which washing machine is best for the environment *overall*? To answer this difficult but vitally important question requires a detailed understanding of how the machine washes, how it is made, where the materials come from, how much energy is used in making and transporting the appliance along its way to your door, and so on.

A recent 77-page report prepared for the Consumers' Association addressed this enormous task for an imported and an Australian front loader and an Australian top loader — and you can buy a copy. It's called *Life Cycle Analysis*, and is available from the Consumers' Association for $40, which includes postage and packing. Write to: Lisa Walton, 'Life cycle analysis', Consumers' Association, 57 Carrington Road, Marrickville 2204, or phone Lisa on (02) 558 0099 with a credit card order.



LETTERS

Send your letters to **CHOICE, 57 Carrington Road, Marrickville 2204**. Where possible, please include your daytime telephone number, as we may wish to contact you direct for more information or to discuss your comments and queries.



Our November 1992 article, *What price vet fees?*, provoked a good deal of comment from both vets and from satisfied customers who wanted to sing the praises of their particular vet. The following letters are a sample of the reactions.

VETS DO CARE!

I recently had the misfortune to read the article on veterinary fees (CHOICE, November 1992). This was one of the most biased, inaccurate and one-sided articles I have ever read. It implied that all vets, with the exception of those you carefully screened for the article, are engaged in wholesale fraud and deception of the public. The author carefully avoided any favourable comments about vets, and managed to portray the owner-pet relationship as similar to that between a person and his/her car — a piece of equipment that is readily replaced when worn out or too expensive to run and maintain.

It may surprise you to learn that vets do actually care for animals; that euthanasia of a healthy animal is distressing; that the majority of our clients are grateful for what we can do; that our clients on the whole expect an accurate diagnosis, not an informed guess. It may also come as a surprise to learn that a modern veterinary practice offering quality medicine has high overheads — from wages for qualified staff to electricity and rates.

Vets on average work up to 10 or 12 hours a day to provide a professional, convenient service. The majority provide free or cheap services to guide dogs, wildlife and organisations such as schools and kindergartens. Many give up their free time to give lectures, judge pet shows, etc. Yet your article has portrayed us all as money-hungry, greedy rip-off merchants lying in wait for unsuspecting little old ladies.

Most vets discuss treatment options and associated costs with the clients prior to treatment and surprise, surprise, our clients agree to these costs. Yet you failed to talk to anyone who was happy with their vet — are you going to say you couldn't find any? Or are their opinions incompatible with your storyline, or not in agreement with self-styled experts such as the dog breeders and judges mentioned in your article?

I do agree that some overservicing does occur, but not to the extent that you indicate. And, judging by the veterinary opinions expressed in your article, it would seem that underservicing and negligence are potentially a greater problem.

Vets do encourage clients to discuss costs before treatment, but I recognise that problems do exist — but on both sides. Some vets are too embarrassed to discuss costs, some clients do not listen until finally asked to pay in hard cash.

Up to now I had significant respect for CHOICE, but I now consider it to be just another rag pushing its own barrow.

R Doneley
Vet
Toowoomba, Qld

*We have no 'barrow' to push regarding veterinary care. Our article was an attempt to show that while some (and we emphasise **some**) vets were in the wrong — by not fully informing clients, or by overservicing — clients too must take responsibility by asking questions and making decisions. We didn't say there's no such thing as a conscientious vet — in fact a number of vets were shown in a good light by the comments they made. As you point out, problems exist on both sides of the vet-owner relationship. We wanted to show pet owners that they have to take part in the process too — that their animals are **not** like cars or pieces of furniture; hence our comment, "...although we say euthanasia should be available ... we're not implying it should be used as an alternative to taking responsibility for the animal's welfare."*

SHOP AROUND FOR VETS

Congratulations on *What price vet fees?* (CHOICE, November 1992). As a veterinarian trying to deliver both quality of service and treatment to my clients, yet at a price that will let me sleep peacefully at night, I am continually told that the place down the road charges twice the price for the same work. Your article stressed the advantages of shopping around, your horror stories are typical and very common in this area.

Very often people rush their animal to the nearest available vet for emergency treatment, then feel locked into that practice for the surgery that may follow. It is important to emphasise that you can elect to change vets any time during treatment, that x-rays and test results are the property of the client, not the veterinary practice; after all, they paid for them.

J Montgomery
Vet
Queanbeyan, ACT

BADDIES ARE A MINORITY

In my 32 years as a veterinarian I have seen my profession develop competence that is unsurpassed in the world. For this I am very proud.

Your article *What price vet fees?* (CHOICE, November 1992) provides anecdotal descriptions of the behaviour of a very small minority of veterinarians. The large majority are decent, humane and caring professionals, few of whom are fully compensated for the long, hard hours of service they provide to animal owners.

For every one complaint you hear about a veterinarian, there are many acts of kindness and generosity by veterinarians that go unappreciated, unreported and unpaid.

I Carter
Vet
Deception Bay, Qld

WHAT DO YOU KNOW?

1 The letters SGL stand for:
A) Standard Government Loans.
B) Superannuation Guarantee Levy.
C) State Government Lotteries.

2 How did the BAD tax get its name?
A) After its introduction in August 1982, there was an enormous backlash from bank customers, who said any government tax on savings accounts should be called a BAD TAX!
B) It is a Commonwealth Government tax on Bank Account Debits, thus the letters B-A-D.
C) It is a Commonwealth Government tax on Bank Account Deposits, thus the letters B-A-D.

3 Which organisation participates in the money market to influence interest rates, enabling the government to tighten or ease monetary policy?
A) The Reserve Bank of Australia.
B) The Australian Securities Commission.
C) The Treasury.
D) The Insurance and Superannuation Commission.

4 Scalds are a common and potentially serious problem for young children. Which of the following is the source of hot liquid which causes the most scalds?
A) Saucepans
B) Taps
C) Kettles
D) Cups

5 In which area of the home do most scalds occur?
A) Bathroom.
B) Living area.
C) Kitchen.

6 Which of the following was the largest oil spill in Australia's maritime history?
A) The Spencer Gulf spill in South Australia.
B) The Exxon Valdez spill.
C) The oil tanker Kirki spill off the Western Australian coast.

ANSWERS

1. B — and we'll be bringing you an article about it in an upcoming issue.
2. B.
3. A.
4. D — According to a study conducted by the NSW Childsafe Injury Surveillance System, 48% of scalds in children (out of a total of 721 cases) were caused by cups of tea or coffee. Saucepans caused 12%, taps 12%, kettles 10% and other sources 18%.
5. C — 47% of scalds occur in the kitchen, 22% in the living area and 11% in the bathroom.
6. C — 17 000 tonnes of oil were spilt when the oil tanker Kirki split in two off the Western Australian coast in 1991. Oil spills are currently the subject of two government reviews: a South Australian government inquiry which reviewed the clean-up after the Spencer Gulf spill, and the Australian Maritime Safety Authority which is examining the 18-year-old national plan to combat pollution of the sea by oil.

RECALLS AND BANS

If you find a recall or ban not on our list please let us know.

Mistral has recalled **MISTRAL PEDESTAL FAN SF16** made by Shell Electric Mfg (AC 240 volts, 50 Hz, 0.19 amps, registration number Q91104 or Q91150) as an incorrect terminal block may be a fire hazard. If you have purchased one of these fans since July 1991 contact WAM Electrical on (03) 890 3336 to arrange for free replacement of the incorrect part.

Panasonic Australia has recalled **PANASONIC RICE COOKERS SR-W10GHP** (sold after June 26, 1992) as some have been made with a small hole above the power cord fixture. Insertion of fingers or instruments into the hole could result in injury due to contact with electrical wiring. Contact Panasonic for free replacement of cooker: phone 008 806 030.

Robertshaw Controls (Australia) has recalled **RHEEM, VULCAN, HARDIE DUX GAS WATER HEATERS** (as listed below and made in July, August, September and October 1992) due to faulty gas controls which may allow gas to escape, creating a fire risk. Affected models are:
■ **RHEEM:** capacities of 90, 135, 170, 200 and 260 litres, with serial numbers between 338380 and 422564. Phone (02) 647 2700 or (02) 748 5400 for service.
■ **VULCAN:** capacities of 120, 145 and 185 litres with serial numbers between 1006203563 and 1006298453; capacities of 90 and 135 litres with serial numbers between 338380 and 422564. Phone (02) 666 0222 for service.
■ **HARDIE DUX:** capacities of 90, 135, 170 litres, model numbers C30, C32 and C40 with serial numbers between 2287586 and 2296212. Phone 008 024 898 for service.

Mitsubishi Electric AWA has recalled **AWA 34 cm COLOUR TELEVISIONS, MODELS C3420** and **C3421** (sold from late 1987) as possible soldering defects in electronic circuit joints may cause adjacent parts to burn inside the set. Do not turn on the set until it has been inspected. Affected serial numbers are:
■ **Model C3420:** 3420 0001 to 3420 8765.
■ **Model C3421:** 3421 0001 to 3421 6570.
Phone Mitsubishi Electric AWA on 008 811 212.

Ryobi has recalled **RYOBI SANDING KIT 6070963** (sold after July 20, 1992) as the rubber backing pad may be faulty. This pad may also be found in **RYOBI GRINDER KIT HG100K**. Use of a faulty backing pad for sanding may lead to injury to the operator. Contact Ryobi for replacement of pad: contact your local Ryobi dealer or phone (02) 772 2444, (03) 764 8655, (07) 273 6077, (077) 72 4988, (08) 362 4801, (002) 720321 or (09) 353 1311.

Shell has recalled a batch of **SHELL DIESEL FUEL** sold as **SHELL FORMULA DIESEL, SHELL DIESOLINE** and **SHELL GAS OIL**, from Shell's Pinkenba terminal, as it has been contaminated with unleaded petrol. This lowers the flash point, making safety in storage and handling a concern, particularly with oil-fired boilers and furnaces. Affected fuel was sold between October 16 and 26, 1992, from Pinkenba terminal or from the following Shell distributors: Springwood, Murgon, Roma, Goondiwindi, Bowen Hills, Ipswich, Miles, Glen Innes, Strathpine, Southport, The Gums, Grafton, Nambour, Dalby, Stanthorpe, Coffs Harbour. Contact Shell Pinkenba terminal on (07) 364 5100 to arrange testing and possible collection and replacement.

Toyota has recalled **TOYOTA CAMRY VEHICLES SV21** and **VZV21** with central locking (fully imported models produced between August 1986 and February 1990, locally made models between November 1986 and July 1990) as the power door lock control relays may fail and become inoperative, potentially trapping occupants inside the car. Contact Toyota for rectification. Affected vehicles are:
■ Frame/VIN number range: SV21 9000001-9047913; VZV21 0000041-0026813; 53SV21 09050000-09121978; 72SV21 09300003-09307566; 53VV21 00026191-00113393.

General Motors-Holden's Automotive has recalled **HOLDEN JK APOLLO SL/E VEHICLES** for the same problem as the above Toyota Camry recall. Affected vehicles are:
■ Sedan ISO VIN range: 6T1 53 SG21 09800001-6T1 53 SG21 09801024.
■ Wagon ISO VIN range: 6T1 72 SG21 09850001-6T1 72 SG21 09850317.

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FEBRUARY 1992 — JANUARY 1993

(T) test
(D) includes assessment of suitability for those with disabilities
(F) feature — general advice
(M) feature — includes market information
(S) subscriber survey or user trial
(C) Consumer in law
(L) letter
(U) update of previous report
*** additions or corrections to reports**

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